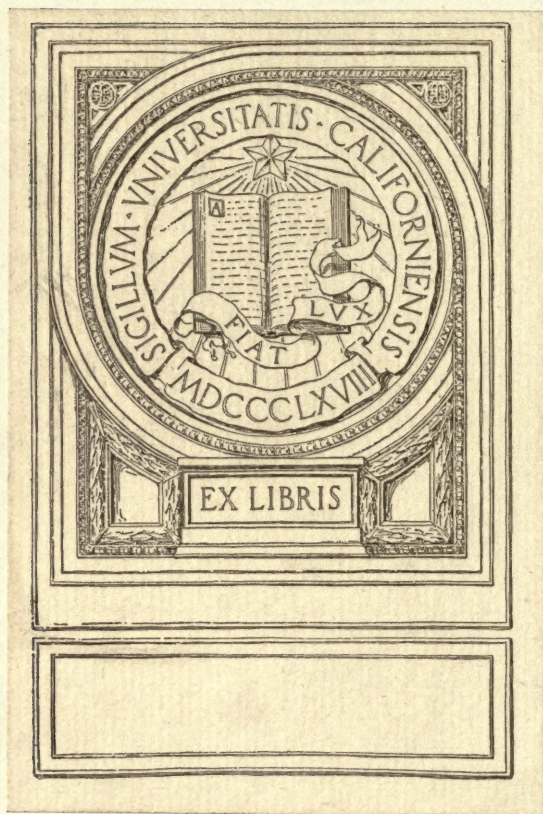


The North Eastern Railway

Its Rise and Development



W. W. TOMLINSON.



THE
NORTH EASTERN RAILWAY
ITS RISE AND DEVELOPMENT



The North Eastern Railway

Its Rise and Development

BY

WILLIAM WEAVER TOMLINSON

Author of

*"Life in Northumberland during the
Sixteenth Century," and other works.*



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TO WHOM
IT MAY COME

PREFACE.

The first contribution to the history of the North Eastern Railway was Mr. J. S. Jeans' account of the old Stockton and Darlington Railway, compiled as a memorial of the railway jubilee in 1875. Two years later the story of the Darlington and Barnard Castle Railway was told by Mr. G. T. Richardson, and in 1879 Mr. G. G. MacTurk published a few historical notes on the Hull railways. Then, after the lapse of several years, came the series of changes which ushered in a new railway era, and the present work was projected. It has been written with full access to official documents, and on a scale sufficiently large to admit of a fairly adequate treatment of so wide a subject. An epitome of railway progress, inasmuch as it affords an opportunity of following, within the limits of a single railway system, every step in the evolution of transport by rail—from the horse-drawn coaches and trucks of 1825 to the electric cars and high capacity waggons of the present day—the history of the North Eastern Railway has a special claim to public notice.

The initial difficulties presented by the history were mostly due to the way in which the North Eastern Railway had been formed—by the amalgamation of a large number of independently authorised lines. To have dealt with these separately would have caused a great deal of overlapping. It was thought preferable to regard these lines from the very outset as parts of a system in the making.

The plan of the present work embraces: a brief account of the work done on the early waggonways previous to the projection of the Stockton and Darlington Railway; a history of the lines amalgamated in 1854 to form the North Eastern Railway and of the early lines which were afterwards absorbed by it; and a history of the North Eastern Railway, as distinguished from its constituent elements, during the first fifty years of its existence (1854-1904). In an appendix will be found a short summary of events which have occurred between 1904 and 1914, and the statistical information contained in the other appendices is brought up to the latest date possible.

A necessary pendant to this plan was a comprehensive scheme of illustration embracing maps, diagrams, portraits and views of every kind, especially of the engineering features of the older railways. The list of illustrations in the volume represents a long and patient search for the necessary prints.

The author has anticipated, he believes, the desires of the general reader in devoting a considerable amount of space to the early history of the Stockton and Darlington Railway. It is a fortunate circumstance that, though this railway is the oldest in the world, its records are practically complete, and from many a mildewed and discoloured document facts have been recovered which throw fresh light on railway history.

In bringing this work to a close the writer has to acknowledge his indebtedness to Mr. T. E. Forster, Mr. R. C. Clephan, the late Mr. W. S. Daglish, the late Mr. R. Nelson, and the late Mr. M. Mackey, for placing at his disposal valuable collections of railway papers, and to Mr. B. Anderton for special facilities of access to those in the Newcastle Public Library; also to the Directors of the Great North of England, Clarence and Hartlepool Junction Railway for permission to consult their minute books. His thanks are tendered to Mr. C. A. Harrison, Dr. W. B. Simpson, Mr. J. A. Irving, Miss Lowry, Mrs. Graham, Mr. H. B. Saint, Mr. J. Fairless, Mr. H. G. Lewin, Messrs. Merz & McLellan, Mr. J. S. MacLean, Mr. R. W. Martin, Mr. W. G. Brown, Dr. Laws, and Dr. Evelyn for the loan of prints, blocks, books, etc., to Mr. J. C. Hodgson, F.S.A., and Mr. R. O. Heslop, M.A., F.S.A., for their kindness in reading proofs, and to those members of the North Eastern Staff who have assisted him in any way.

In the final stages of the history it was found necessary to condense and partially to re-arrange the last chapter, and owing to an illness of the author the task was undertaken by Mr. Randall Davies, F.S.A., to whom due acknowledgment is now made. For the carefully compiled index, without which a work of this kind would be incomplete, the author is indebted to Mr. E. M. Bywell.

W. W. T.

NEWCASTLE-UPON-TYNE, *November*, 1914.

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PLATE I.



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T. L. Atkinson, sc.

Joseph Pease.

THE NORTH EASTERN RAILWAY: ITS RISE AND DEVELOPMENT.

INTRODUCTORY.

In a map of England where the railways are represented by different tints nothing is more noticeable than the unique territorial position of one wide-branching system. South of the Humber the lines of the various Companies cross and recross each other with bewildering frequency; north of it, the variegated character of the map changes, and a single colour suffices to distinguish the well-ordered network of lines of the North Eastern Railway stretching over the greater part of Yorkshire and Northumberland, the whole of Durham and portions of Cumberland and Westmorland.

By following the river from Hull to Goole and proceeding by way of the Lancashire and Yorkshire, the Midland, and North British lines to Methley Junction, Leeds, Carlisle, and Kershope Foot, continuing afterwards along the Border to Carham, down the Tweed to Berwick, and by the coast to Hull again, a traveller would practically be "beating the bounds" of a district for which the North Eastern Railway provides nearly the whole accommodation, a district, it is interesting to note, co-extensive with the greater part of the ancient kingdom of Northumbria. Two other railways have broken through these imaginary bounds—the North British Railway which, by the purchase of three unremunerative lines, gained admission from the north to the sparsely populated valleys of the North Tyne, the Wansbeck and the Upper Coquet, and the Hull, Barnsley and West Riding Junction Railway which, a few years ago, crossing the Aire and the Ouse, and raiding as it went a few villages on the Yorkshire Wolds, made an Homeric attack on the port of Hull,

The North Eastern Railway extends for a few miles beyond the boundary lines just mentioned—on the south to Thorne and Haxey, Shaftholme Junction, Dinnington Junction, Swinton, and Altofts Junction; on the west to Tebay and Clifton Junction; and on the north, over the Border, to Sprouston Junction, having, as a matter of fact, two stations in Scotland. It is touched at a few points by the lines of the Midland, the London and North Western, the Lancashire and Yorkshire, the Great Northern, the Great Central, the North British, the Caledonian, the Cockermouth, Keswick and Penrith, and the Maryport and Carlisle Railway Companies. Secure within their borders, the North Eastern Railway Company are enabled to carry on the work of developing the resources of their district without having to engage in a ruinous competition for traffic.

From a diagrammatic view of the North Eastern Railway, representing the great trunk line from Doncaster to Berwick sweeping past or through the towns of Selby, York, Thirsk, Northallerton, Darlington, Durham, Gateshead, Newcastle-upon-Tyne and Morpeth; the auxiliary main line from Leeds to Harrogate, Stockton, Sunderland and Newcastle-upon-Tyne; the cross-country lines from Leeds to Hull, from Tebay and Penrith to Middlesbrough and the Hartlepoons, and from Carlisle to South Shields and Sunderland, connecting, in conjunction with other railways, the ports of the West Coast with those of the East Coast, and the Company's splendid series of docks; the winding line along the Yorkshire coast communicating with famous watering-places; and all the numerous branch lines intersecting the country, the chief impression received will probably be that of harmony of design.

And yet the North Eastern Railway, so suggestive of organic unity, is the most composite of systems. It is really an aggregation of lines constructed at different times by fifty-three independent public companies and twenty-one private companies or individuals, and gradually brought together by the process of amalgamation, to which must be added eight lines constructed jointly with other railway companies, a line held under lease and another worked and maintained and about to be absorbed into the system. As an illustration of this composite character take, for example, the main line, which no more suggests the piece-meal method of formation than the other divisions of the East Coast route, from London to Doncaster, or from Berwick to Edinburgh, and yet it may be split up into sixteen constituent parts, as follows;—

DATE OF CONSTRUCTION OF THE VARIOUS PORTIONS OF THE NORTH EASTERN RAILWAY
COMPANY'S MAIN LINE.*

No.	DATE OF OPENING.	LENGTH.		DESCRIPTION.		BY WHAT RAILWAY CONSTRUCTED.	
		Miles.	Chains.	From.	To.		
1	1829	1	30	Park Gate Junction, near Darlington.	Croft Branch Junction, near Darlington.	Stockton and Darlington Railway.	
2	1839	1	55	Locomotive Signal Box near Engine Sheds, York.	Chandler's Whin† Junction, near Dringhouses.	York and North Midland Railway.	
3	1839	1	11	Argyle Bridge, near Manors.	Heaton Junction ...	Newcastle and North Shields Railway.	
4	1840	—	64	Barlby Junction ...	Selby Old West Junction	Hull and Selby Railway.	
5	1841	42	29	Landing Lane Bridge, near Severus Junction, York.	Croft Branch Junction, near Darlington.	Great North of England Railway.	
6	1844	14	22	Parkgate Junction, Darlington.	Hoggersgate, near Thinford.	Newcastle and Darlington Junction Railway.	
7	1847	63	74	Heaton Junction ...	Tweedmouth ...	Newcastle and Berwick Railway.	
8	1848	—	43	Castle Junction, Newcastle.	Argyle Bridge, near Manors.	York, Newcastle and Berwick Railway.	
9	1849	—	37	Gateshead Junction.	Newcastle Central Station.	Do.	Do.
10	1850	1	9	Tweedmouth ...	Berwick (end of Royal Border Bridge).	Do.	Do.
11	1857	2	34	Newton Hall ...	Relly Mill Junction	North Eastern Railway.	
12	1868	12	38	Gateshead Junction.	Newton Hall ...	Do.	Do.
13	1871	11	11	Chandler's Whin† Junction, near Dringhouses.	Barlby Junction, near Selby.	Do.	Do.
14	1871	14	3	Selby Old West Junction.	Shaftholme Junction	Do.	Do.
15	1872	6	11	Relly Mill Junction	Hoggersgate, near Thinford.	Do.	Do.
16	1877	1	27	Locomotive Signal Box, near Engine Sheds, York.	Landing Lane Bridge	Do.	Do.
		175	18	Total Length of Main Line.			

* The main line between Redheugh and Newcastle is now duplicated. Since 1906 all the Scotch expresses have crossed the Tyne by the King Edward Bridge and passed into and from the Central Station over a portion of the Newcastle and Carlisle Railway.

† Otherwise "Chaloner Whin," a variation no doubt attributable to the Ordnance Surveyors,

The North Eastern Railway as a corporate entity dates only from the year 1854, when it was formed by the union of—

The York, Newcastle and Berwick Railway.

The York and North Midland Railway.

The Leeds Northern Railway.

Since that time it has absorbed many of the earlier lines, among them the famous Stockton and Darlington Railway.

By means of these early lines the North Eastern Railway is enabled to reach back to the very beginning of the railway era. But its roots strike far deeper into the past than the date of the first prospectus of the Stockton and Darlington Railway, and, to understand certain peculiarities of its development and several curious facts of its history, it is necessary to glance at the economic conditions of the North of England a century and a half before this time and to note a few of the stages in the evolution of the railway system.

It will be found that the North Eastern Railway not only includes the earliest lines, but that the district it occupies is in reality "the native land of railways,"* though the suggestions of the tramroad and the steam engine came from without, the one from Germany, the other from Cornwall.

The small four-wheeled tram used in the metalliferous mines of Germany previous to the year 1556—the date of the first edition of Agricola's treatise "*De Re Metallica*" in which it is represented—may possibly have been brought into this country by the German adventurers who opened out copper mines at Keswick in the reign of Queen Elizabeth.

If so, it is obvious how the coal-owners of the Tyne might come to hear of it, viz.: through the agents of the Earl of Northumberland, who put forward a claim to the mines on the ground of a prior grant. His subsequent interest in them is shown by the existence at Sion House of a report on the state of the mines, with copies of letters and forms of working metals, some translated from the German (1617-1621).†

To the early years of the seventeenth century must be ascribed the laying of the first waggonway. For the introduction of this new method of transport the North of England is indebted to a certain Master Beaumont, "a gentleman of great ingenuity and rare parts,"‡ who has now been identi-

* A phrase of Thos. Sopwith's, *Guide to Newcastle*, 1838, p. 103.

† *Hist. MSS. Commission*, Appendix to 6th Report, p. 103.

‡ *Gray's Chorographia*, 1649, Crawhall's Edition, p. 86.

fied as Huntington Beaumont of Bilborough, one of the lessees of the coal in Cowpen and Bebside and a tenant of Bebside Hall.* Wooden waggonways are known to have been formed from the pits which he worked to the river Blyth previous to 1618, and therefore, when crossing Bedlington Viaduct from the north, we have a view of what is probably the very birthplace of railways. The venture of Huntington Beaumont, in spite of improved methods of working and conveying coals, proved unsuccessful, and, after losing £20,000, he rode home on his light horse and, in 1623, died at the comparatively early age of 62. His example in regard to the conveyance of



Sketched by J. Bailey.

Drawn and Engraved by Jas. Fittler, 1785.

A "RUN" ON THE PARKMOOR WAGGONWAY, GATESHEAD.

coals seems to have been speedily followed, and as early as 1650 there are numerous references to waggonways in the neighbourhood of Whickham and Winlaton.† From about 1620 to 1820 the northern coal-field was the theatre of experiments which culminated in the formation of the Stockton and Darlington Railway.

No other railway in the world can claim such a direct lineal descent from the old waggonways as the North Eastern Railway, for it still retains as an integral part of its system—relaid and adapted, of course, to steam loco-

* *History of Northumberland*, vol. ix., 1909, p. 229.

† Whickham Register of Burials.

tion—portions of the most remarkable of these early coal lines—the coal lines which led from the Tanfield and Pontop districts to the Tyne. Over the former of these, the embankments, cuttings, and other engineering features of which made it an object of interest to eighteenth century travellers, coal has been carried to staiths at Dunston, without intermission, for 190 years. The Tanfield line occupies a notable position in railway history. The circumstances under which it was formed belong to an important period of development in the coal trade, and something more than a passing allusion must be given to them.

Previous to the eighteenth century, coal for exportation—sea coal as it was called—was worked in collieries at no great distance from the places of shipment on the Tyne and Wear, or at Blyth, Seaton Sluice, and Cullercoats. The owners or lessees of these collieries had generally a right of way over the lands intervening between the pits and the staiths. But when the mines adjacent to the river were exhausted and the coal-owners found it necessary to “advance their works several miles into the country,”* they met with engineering difficulties to which they had not been accustomed, and, moreover, were confronted with the important question of wayleaves—a question which has since had no slight influence on the fortunes of some of the lines merged in the North Eastern Railway. One of the things which struck Roger North, the brother of Lord Keeper Guilford, in 1676, as remarkable in the neighbourhood of Newcastle, was the system of wayleaves, and he made a note of the fact that the owner of a rood of ground between the colliery and the river would expect £20 per annum for the leave to pass over it.† The exactions of the landowner at this time were such that the Company of Hostmen, of Newcastle-upon-Tyne, passed a resolution to apply to Parliament for an Act to regulate wayleaves and staith-rooms. They took no steps, however, in this direction until the 20th of February, 1696, when a petition on their behalf was presented by Sir Wm. Blackett.‡ Nothing seems to have come of it, and the abuses complained of continued.

William Ramsay, lessee of the manors of Whickham and Gateshead from the Bishop of Durham, and still more William Cotesworth, who succeeded him in 1716, “play’d the tyrant over their neighbours, and made

* Petition of the Corporation of Hostmen of the Town and County of Newcastle-upon-Tyne. *Hostmen’s Book*, Surtees Soc., vol. cv., p. 151.

† Roger North’s *Life of Lord Keeper Guilford*, 1742, p. 136.

‡ Extracts from the *Records of the Newcastle Hostmen’s Company*. Surtees Soc., vol. cv., p. 151.

themselves masters of the wayleaves and great part of the collieries, and thereby got near £3,000 per annum for one colliery (three-fifths more than ever the owners received to their own use).”*

The annual value of some of the ground in Whickham Moor over which this wayleave was granted, it appears from another source, was not worth above 2s. per acre, and “not so much as a whole acre was damaged by the way.”†

The heavy wayleave rents impeded but did not stop the inland movement from the Tyne, and in the second decade of the eighteenth century George Pitt, of Strathfieldsaye, opened out the great Tanfield coalfield, availing himself of the waggonway laid in 1712 over Tanfield Moor by Sir John Clavering and Thomas Brumell from their Lintz and Buck’s Nook Collieries. Having laid other waggonways of his own he came into collision with William Davison of Beamish, the lord of the manor, who demanded a wayleave rent on the ground that the liberty of passage enjoyed by Pitt was confined to carts and wains and did not include waggons, and that he had no right to break the soil in order to make these waggonways. Pitt demurred on the ground that the reservation of wayleaves ought not to be restricted to any particular sort of carriage or any particular method of conveying the coals, that the term imported a general liberty of doing it in the most convenient way. Much less damage, he maintained, was done to the surface by waggons kept on one wooden way than by carts and wains which made such deep ruts in the moor that new tracks were required from time to time for them to go in.

George Pitt being a member of Parliament, the question, from fear of a breach of privilege, was allowed to remain in abeyance. In 1719, however, Dame Jane Clavering, widow of Sir John Clavering, who had died in 1714, having purchased for £4,000 Davison’s rights in Tanfield Moor with the object of getting control of the wayleaves, the question cropped up again and, in 1721, was referred to the Court of Chancery, ultimately being decided in favour of Lady Clavering.‡

With wayleave after wayleave barring his course to the place of shipment, and miles of railway to lay down, it was impossible for the owner of a royalty at a distance from the river to work his coals at a profit. This condition of things produced the most powerful co-partnership that the coal

* *Spearman’s Inquiry*, 1729, p. 112.

† *An Inquiry into the Reasons of the Advance of the Price of Coals*, 1739, p. 18.

‡ *Pitt v. Clavering*, *Chancery Proceedings*, May, 1721.

trade has known. It consisted of (1) the Hon. Sidney Wortley Montagu, of Wortley; his son, the Hon. Edward Wortley Montagu, ancestor of the statesman with whom the *Wharnccliffe meeting* originated; and Thomas Ord, of Newcastle-upon-Tyne; (2) Sir Henry Liddell and Colonel George Liddell of Ravensworth Castle; and (3) George Bowes, of Gibside, "commonly distinguished in the north," as a writer stated in 1739, "by the name of the Grand Allies."*



Thos. Jameson, del. et sc.

TANFIELD ARCH.

The Liddells and Montagus had already been associated in the working of Blackburn, *alias* Burdon Moor, Colliery, held by lease of the Bishop of Durham, and had gained possession of a number of royalties, leasing the coal under the freehold lands of Thomas Dawson and William Davison at Tanfield, and of Ralph Clavering, jun., at Causey, and they had begun to construct "at the expense of many thousand pounds"† the longest and most remarkable waggonway which had so far been laid down. Besides some large

* *An Inquiry into the Reasons of the Advance of the Price of Coals*, 1739, p. 8.

† *Brief for the Coal Owners*, February, 1738-1739.

cuttings, the works comprised a huge embankment across the valley of the Beckley Burn, which rendered necessary the making of a drift through the solid rock for the course of the diverted stream, and the building of a stone bridge of a single arch 102 feet in span over the stream higher up, famous as the Causey Bridge or Tanfield Arch. The Chancery case, already quoted, gives a description of the permanent way of the period:—

“For the making of waggonways the ground must be made as level as possible, without narrow turnings, and pieces of hard timber or wood called sleepers must be fixed in the ground, and raised some inches from the ground, for the wheels of the waggons to run on, and can be used only by waggons and not by carts.”*

The engineering features of this remarkable waggonway made it one of the wonders of the district, and Dr. William Stukeley, the eminent antiquary, with his companion Richard Gale, who were in Newcastle during the early part of September, 1725, found it well worth seeing, even after the Roman Wall. The *Iter Boreale* gives an account of the visit:—

“We saw Colonel Lyddal’s coal-works at Tanfield, where he carries the road over valleys filled with earth, 100 foot high, 300 foot broad at bottom: other valleys as large have a stone bridge laid across: in other places hills are cut through for half a mile together, and in this manner a road is made, and frames of timber laid for five miles to the river side, where coals are delivered at 5s. per chaldron.”†

Uniting with George Bowes, who had estates at Marley Hill and Hedley, rights over Hedley Fell, and a joint interest in Park Head Colliery, and who had recently purchased a colliery at Shield Row, the Liddells and Montagus came to an agreement on the 27th of June, 1726, “to join some of their collieries and to enter into a friendship and partnership for the purchasing or taking other collieries, and for winning and working of coals thereout, and to exchange benefits and kindnesses with each other, upon a lasting foundation,”‡ George Bowes contributing his share of the expense incurred “in making and erecting the bridge called Dawson’s Bridge (the Tanfield Arch), and of drifting into and winning the colliery called Mr. Dawson’s Colliery.” The collieries specified were to be held in thirds from the 11th of November, 1726, for a term of 99 years, the coal was to be worked jointly but led to separate staiths and vended distinctly. The partners agreed to

* Pitt v. Clavering, *Plea and Demurrer of Dame Jane Clavering*, 12th October, 1721.

† *Itinerarium Curiosum*, 2nd ed., centuria ii., p. 69.

‡ *Articles of Agreement Quadripartite*, 27th June, 1726. Copy in possession of J. B. Simpson, Esq.

pay 5s. a ten—a measure consisting in this instance of 46 tons and a few hundredweights—to William Cotesworth for all coals led from these collieries, whether conveyed over his lands and to his staiths or not, he undertaking not to open out new collieries or let further wayleaves to any other persons through his manors or lands, or grant staith-rooms to them without the consent of the partners. By this agreement they got the monopoly of the most valuable mineral district in the North of England.

In conformity with the principle which they had adopted of working the collieries on lease and “reserving great parts of those in their own estates for futurity,”* the Grand Allies extended their waggonway to Beamish South Moor and Shield Row, a distance of eight miles from the river.

The Tanfield Moor coals of George Pitt came on to the line at Bowes Bridge, and practically the whole of the coals from Tanfield and the South Moor District passed over the waggonway to the Tyne.

To accommodate the large quantities of coal that came down the line they were obliged to build large covered staiths at Dunston, and beneath the roofs of these staiths, when the summer's vend was over, they laid as many as 90,000 London chaldrons.†

The story of the doings of the “Grand Allies” does not come within the scope of the present work, but it may be mentioned as a point of interest affecting the Tanfield line that, by the famous agreement of January 31st, 1731-1732, entered into by the coal-owners for the regulation of the vend, 108,000 chaldrons were apportioned to the partnership collieries, and 17,000 to Tanfield Moor Colliery:‡ thus five-twelfths of the whole computed vend of the port for the year (301,000 chaldrons) must, as a consequence, have passed along the waggonway, or an average quantity of about 400 chaldrons a day. The immense coal traffic on the waggonway struck Monsieur Gabriel Jars, a distinguished member of the Royal Academy of Science at Paris, when visiting the north of England in 1765, for he recorded the fact that “it was almost always covered with waggons.”§

As one waggon only, in consequence of the steep inclines, could be taken down at a time, and the average quantity of coal conveyed daily was probably greater in 1765 than in 1732, the crowded state of the waggonway, consisting as it did of a single line of rails with passing places or “bye-ways” at intervals, must have been very noticeable.

* *Inquiry into the Reasons of the Advance of the Price of Coals*, 1739.

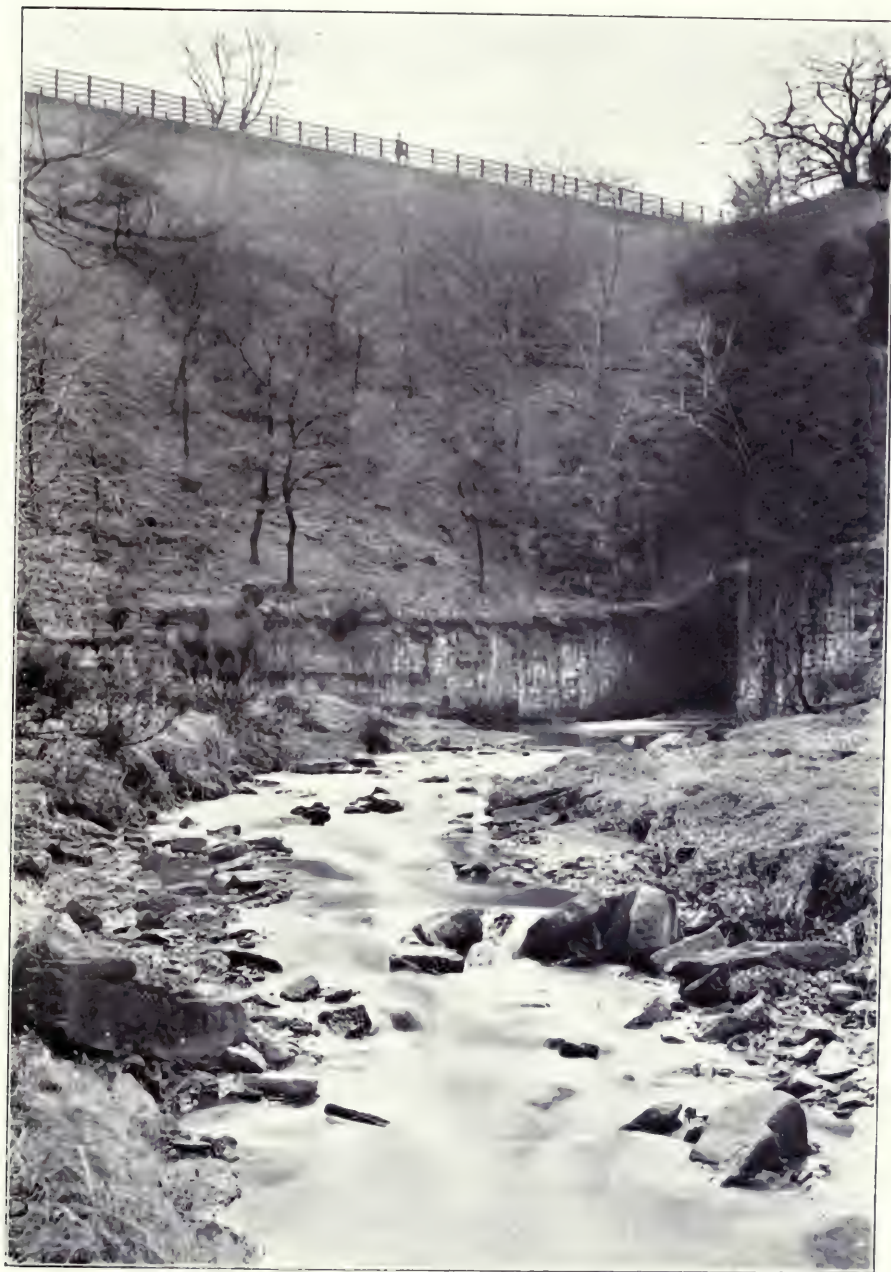
† *Brief for the Coal Owners*, February, 1738-1739.

‡ *Views and Borings*, in the custody of the Society of Antiquaries of Newcastle, vol. ii. p. 238.

§ *Voyages Métallurgiques*, vol. i., p. 205.

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PLATE II.



The Oldest Railway Embankment in the World
(Tanfield Branch, N.E.R.).

About the year 1790 an improvement in the convoy or brake, which is stated to have been effected at Shield Row Colliery,* enabled a horse to take down two waggons instead of one. A breast or block was fixed to the outer as well as the inner side of the brake, so that its action could be extended to both fore and hind wheels as at the present day. By means of the additional friction obtained the waggonman had no difficulty in descending a "run," or incline more than usually steep, with two waggons. Coupling them together, he put down the brake of the first waggon, hanging at the end of it some weight such as a mouth-poke filled with corn, and then stationed himself at the brake of the second in order to regulate the motion.

A few years later, in 1795, an ingenious waggonman named Hall, residing at Pontop Pike Colliery, invented the "Long Brake," which gave him as much control over the first waggon as the second.† This consisted of a lever fixed to the side of the waggon, which, by means of a short chain at the end of it, could force down the brake of the waggon in front. It was afterwards found that by attaching the chain to the front of the waggon the lever could be dispensed with, and a set or train of waggons taken down at one time, for as long as the convoy of the hinder waggon was strongly pressed down, the force of gravity would cause the other waggons to stretch tight the chains, and, in doing so, brake themselves.

After furnishing for so long a relatively high standard of construction, and demonstrating the utility of an improvement so simple and yet of such far-reaching consequences as the brake with double breasts, the old waggonway of the "Grand Allies" passes for a time into the background—to reappear later on as a part of the Brandling Junction Railway—and the centre of interest is transferred to other waggonways more conspicuously associated with the bringing in of the railway era.

Before leaving this part of the Durham coalfield, a reference must be made to an old waggonway, of which the North Eastern Railway still retain in their Harelaw branch about a mile and a half. This waggonway, which in length and cost of construction equalled, if it did not surpass, the Tanfield line, ran from the Pontop, Pontop Pike, Bushblades, and afterwards Tanfield Moor Edge Collieries by way of Bryan's Leap, Rowland's Gill, and Swalwell to Derwenthaugh. It was formed by Lords Windsor and Dunkerron, Matthew Ridley, and John Simpson, who worked the coal demised by

* *Descriptive Account of the Means used on the Tyne and Wear for effecting the Safe Transit of Railway Carriages on Inclined Planes.* Oswald D. Hedley, 1834, p. 11.

† *Ibid.*, p. 13.

Anthony Meaburne—previous to 1729*—to Lady Clavering, Richard Ridley and others. The works between Bryan's Leap and Rowlands Gill were of a very heavy and expensive character. The small portion still in use formed part of the Pontop Pike Colliery branch and as the "Moor" and "South" Pits from which it ran were probably sunk at a later date than some of the other pits of the colliery, it may be attributed rather to the second half of the eighteenth century than the first.

Up to the last decade of the eighteenth century all the waggonways in the North of England were of wood. What was called the "double way" was



Louis le Grand, sc.

WOODEN WAGGONWAY, 1765.

the type most in use; it consisted of fir rails, generally six feet long, pegged down to oak sleepers and having beech rails—known as "false rails"—laid upon and made fast to them. The butt ends were fitted very closely together and sometimes secured by iron bands.† Whenever a steep incline or a sharp curve rendered the draught harder than usual, it was customary to nail thin plates of wrought iron upon the surface of the wooden rails to diminish the friction and prevent the rails from wearing.

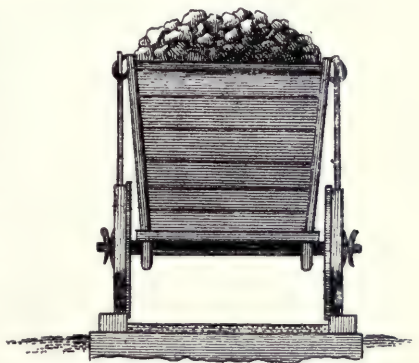
These wooden waggonways did not disappear till long after the establishment of the railway system, and Sir Lowthian Bell, writing in 1863, remembered "within perhaps, twenty years, seeing them in use in the

* *Spearman's Inquiry*, p. 85.

† *Voyages Métallurgiques*, vol. i., p. 201.

Garesfield Colliery Railway,"* which railway, from Rowlands Gill eastward, was really a part of the old Pontop and Derwenthaugh line already referred to. A portion of another of these waggonways, about half a mile in extent, also survived to a late period in the neighbourhood of Ewanrigg Hall near Maryport, much dilapidated and shaken by wear, and a visitor to that place in 1837 made a note of the fact that "some of the wooden rails are covered with thin pieces of iron" and that "only one waggon is brought down at a time which runs the greatest part of the road itself, and is drawn up the incline again by a horse."†

From plating the upper rails with these strips of iron to laying iron bars upon them was an easy transition, and Mr. William Reynolds of the Coalbrookdale Ironworks in Shropshire, by adopting the latter course—as a means of utilising his stock of surplus iron pigs—formed, in 1767, the first iron railway.‡ These pigs were 5 feet long, 4 inches broad, and 1½ inches thick. Plate-rails were used by Mr. John Curr, a native of the Tanfield district, in 1776, for an underground railway at the Duke of Norfolk's Colliery near Sheffield. Then, in 1785, at Alloa, in Clackmannanshire, the first malleable iron railway was laid; bars, an inch and a quarter in breadth and nearly six-eighths of an inch thick being fixed to the wooden rails of the waggonway.§ In 1789 William Jessop laid down on the Loughborough and Nanpantan Railway edge-rails of cast iron. The plate-rail which was almost universally adopted in Wales did not find much favour in the North of England, and fortunately so; it was a development in the wrong direction, and would have retarded the progress of the railway. The only change essential was from the wooden rail to the iron edge rail. The plate-rail was not a necessary intermediate form, as Lord Armstrong assumed in his address to the British Association in 1863. Facts do not bear out his statement that the next



FLANGED WAGGON WHEELS, 1765.

* *Reid's Handbook to Newcastle-upon-Tyne*, 1863, p. 193.

† Richard Lowry's *Diary*, 1837, p. 293-294.

‡ Robert Stevenson, C.E., *Highland Society's Transactions*, vol. vi., p. 13.

§ Sir John Sinclair's *Statistical Account of Scotland*, vol. viii., p. 614.

advance, after the introduction of the iron tramway, "consisted in transferring the guiding flange from the rail to the wheel; this improvement enabled cast iron edge rails to be used."*

The flanged cast iron wheel had been in use in the North of England for half a century before Jessop introduced the iron edge rail, and was not only mentioned by Bishop Pococke in 1760, but described and illustrated in 1765 by Monsieur Jars, who actually gives the depth of the flange, viz., from an inch to an inch and a half.†

The flange was known to the old waggonmen as the "crease"‡ (crease-plates are mentioned as early as 1733), and the men employed to keep the rails clear for the free passage of the flange were called "creasers."§

The cast iron waggon wheel was really a north-country invention. As early as May, 1731, Elias Thornhill of Sunderland, whitesmith, obtained the grant of a patent for "his new invention of making the rim or edge of coal waggon wheels with iron or steel and with iron ribs or 'tabbs' and iron bolts, rivets, and screws for the fastening the same."||

It is not recorded when cast iron wheels were first used in the neighbourhood of Newcastle-upon-Tyne, but we find them running on wooden rails near Bath, from Ralph Allen's quarry to the river Avon, previous to 1734.¶

The flanged waggon wheels had merely to be transferred from the wooden to the iron rails when the latter were laid down.

The first iron railroad in the North of England was constructed in 1797 from Walker Colliery to the river Tyne by Thomas Barnes, who substituted stone blocks for wooden sleepers. Sir Lowthian Bell recollected hearing from Mr. William Losh of the outcry raised against this innovation—all the old engine-wrights declaring that the waggons would run amain on inclines so constructed.** Experience having proved these fears to be groundless, the cast iron edge-rail of "fish-bellied" form was generally adopted on most of the waggonways in the North of England, the

* *A History of the Trade and Manufactures of the Tyne, Wear and Tees*, 1863, p. 4.

† *Voyages Métallurgiques*, vol. i., p. 202.

‡ N. Wood's *Treatise on Railroads*, 2nd ed., 1831, fig. 11, plate iii.

§ Baillie's *Impartial History of Newcastle-upon-Tyne*, 1801, p. 484. To 500 waggonmen employed in the Coal Trade on the river Wear in 1792 there were 80 'creasers' for the ways.

|| *Archæologia Aeliana*, vol. xxiv., p. 226.

¶ Désaguliers' *Course of Experimental Philosophy*, 1734, 1st ed., pp. 189 and 283.

** Reid's *Handbook to Newcastle-upon-Tyne*, 1863, p. 193.

principal exception being the Wylam waggonway, which was relaid in 1808 with plate-rails.

Before the first railway could be successfully taken in hand it was necessary to decide the question of the comparative merits of malleable iron and cast iron rails. Mr. Charles Nixon of Walbottle Colliery laid down on his waggonway, about the year 1805, malleable iron bars two feet in length, joined together by a half lap joint, but as they presented so narrow a surface to the waggon wheels—not more than three-quarters of an inch wide—they cut grooves in the rims, and were soon superseded by cast iron rails with a broader surface.*

More satisfactory results were obtained on the Tindale Fell Railway near Brampton, three miles and a half of which were laid with malleable iron bars between the years 1808 and 1812, and after being in use sixteen years these were found to be little the worse for wear. They were an inch and a half square, and rested on stone blocks. The cast iron rails on the same railway were much worn, and liable to fracture. The experiments with malleable iron rails on the Tindale Fell Railway became known to Robert Stevenson, C.E., of Edinburgh—grandfather of Robert Louis Stevenson the novelist—who drew attention to them in his report on the Edinburgh Railway in 1818.† A copy of this report he sent to George Stephenson at Killingworth,‡ who put it into the hands of his friend Michael Longridge of the Bedlington Ironworks. Now it so happened that at this particular time the Bedlington Iron Company had an offer of coals from the Willowbridge or Bedlington Glebe Colliery at a reduced price provided they would lay a waggonway from the colliery to the works. The reference of Mr. Stevenson to the Tindale Fell Railway and his remarks in favour of malleable iron rails so impressed Mr. Longridge that he decided on laying down rails of this description on the proposed waggonway. Mr. John Birkinshaw, the principal agent at the works, suggested “the idea of making these railway bars wedge-form, by which means the same extent of surface as the cast iron rail was preserved for the wheels to travel upon, and the depth of the bar increased without adding unnecessarily to its weight,”§ and on October 23rd, 1820, he

* Nicholas Wood's *Practical Treatise on Railroads*, 3rd ed., 1838, p. 13. Mr. T. J. Taylor (*Archæology of the Coal Trade*) gives the date of the experiment as 1794.

† *Report of a Proposed Railway from the Coal-field of Mid-Lothian to the City of Edinburgh*, p. 26.

‡ *Life of Robert Stevenson, C.E.*, 1878, p. 129.

§ Letter from Michael Longridge to Geo. Buchanan, appendix No. 1. Geo. Buchanan's *Account of the Lanarkshire Railways*, attached to D. O. Hill's *Views of the Opening of the Glasgow and Garnkirk Railway, &c.*, 1832,

took out a patent for the new rail. Shortly afterwards George Stephenson, by the advice of Mr. Longridge,* joined Thomas Mason, the lessee, as a partner in working the colliery, and the Bedlington Iron Company laid the proposed road for him.†

This waggonway, which George Stephenson probably set out himself, is now used as a footpath by the side of the Morpeth branch (Blyth and Tyne section) of the North Eastern Railway from the neighbourhood of Chopington Station to Bedlington Colliery, from which, to the old staith at the east side of the Bedlington Viaduct, it exists as a strip of waste ground fenced off from the present road to the disused Ironworks.

The importance of this waggonway as a factor in the evolution of the iron road can scarcely be over-estimated. It roused Mr. William James, the original projector of the Liverpool and Manchester Railway, and one of the numerous fathers of railways, to a pitch of almost lyric enthusiasm. "Light has at length shone from the north," he wrote on June 22nd, 1821, "and I pronounce as my decided opinion that the Malleable Iron Rail Road at Bleddington (*sic*) Works is by far the best I have ever seen both in respect of its material and its form,"‡ and Mr. Robert Stevenson writing on the subject of these rails to a correspondent, September 6th, 1821, gave expression to a similar opinion—"But perhaps the best example of this kind of railroad is to be found at Bedlington Ironworks in Northumberland, where Mr. Longridge has laid about three miles of it."§ It was visited by the deputation from the Liverpool and Manchester Railway in the spring of 1824, and rails were shown to them weighing only 17 lbs. per yard "which had been in active use for upwards of three years, but did not appear to have received the least injury from rust."|| Thus was the road prepared in the North of England for the projectors of the early railways.

Concurrently with the improvements effected in the iron road during the first and second decades of the nineteenth century, a remarkable development took place in the power of conveyance. Gravity and steam were brought into use to supplement and, where possible, to supersede the labour of horses, and self-acting inclines, stationary engines, and locomotive

* Letter from Wm. Losh to Ed. Pease. *Railway Collection* in Newcastle Public Library.

† *Ibid.*

‡ *Railway Collection* in Newcastle Public Library.

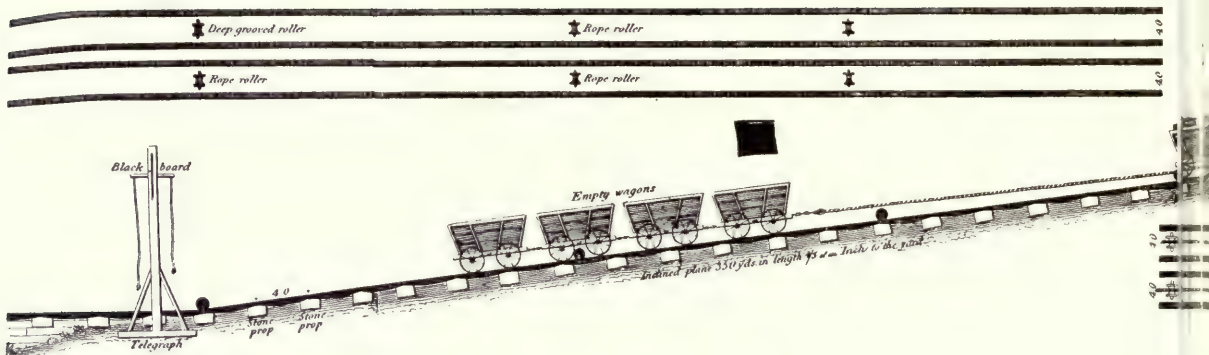
§ Letter addressed to Rd. Scruton, esq., and the other gentlemen interested with him in the construction of a railway in the neighbourhood of Durham. *Mining Journal*, April 5th, 1862.

|| T. G. Cumming's *Illustrations of the Origin and Progress of Rail and Tram Roads, &c.*, 1824, p. 36.

Between pages 16 and 17.

GENERAL PLAN & ELEVATION

from Middleton



The telegraph is turned up or down to note when the empty wagons are hooked on the rope

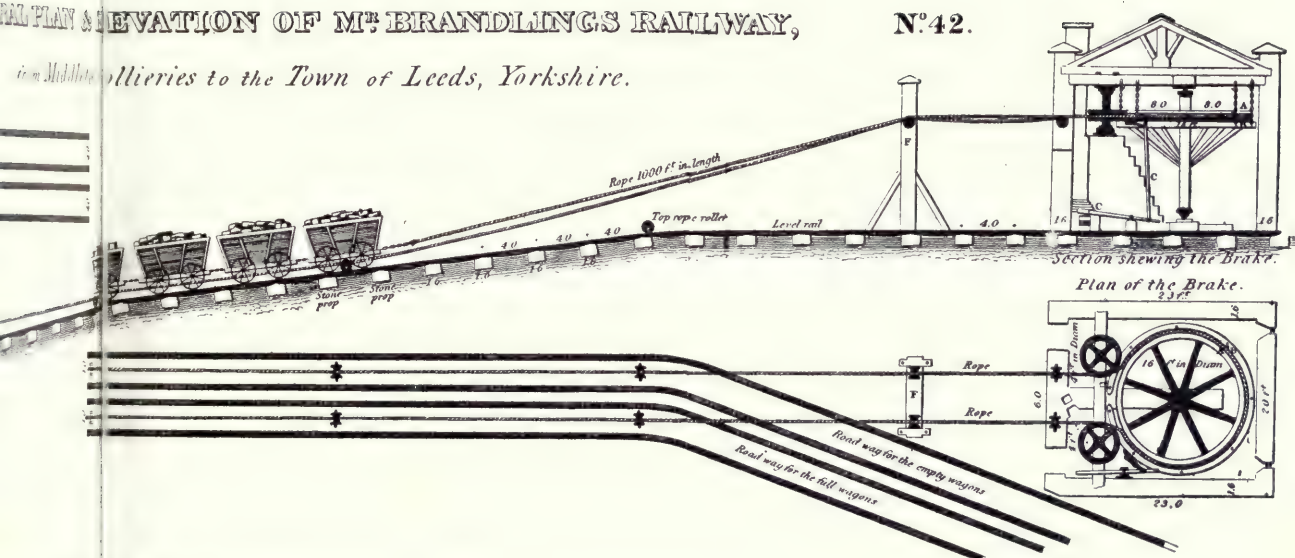
J. Drayton, '60

From Wm. Strickland's "Reports on the"

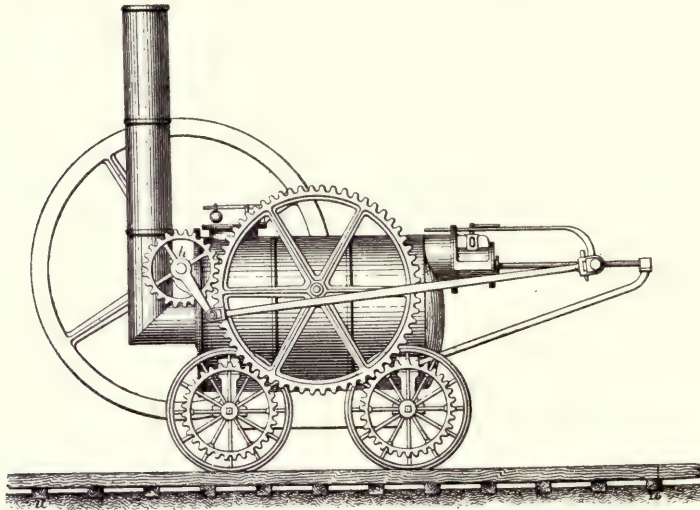
PLAN AND ELEVATION OF MR BRANDLING'S RAILWAY,

N^o 42.

from Middleton Collieries to the Town of Leeds, Yorkshire.



locomotive engine, and the inventor, sending drawings and patterns to John Whinfield, of Gateshead, an iron and brass founder, whom he had appointed his agent for the North of England in 1803,* commissioned him to manufacture it. Thus it came about that, on the banks of the Tyne, in a small foundry in Pipewellgate, the site of which, within a hundred yards of the High Level Bridge, is to-day overlooked by the extensive engine shops of the North Eastern Railway, the prototype of all the locomotive steam giants that sweep past with the East Coast trains in their rear was laboriously



TREVITHICK'S GATESHEAD ENGINE.

fashioned and put together between October, 1804, and May, 1805. In general outline it was similar, but in detail superior, to the Welsh locomotive. It had a wrought iron boiler with return flue, a horizontal cylinder seven inches in diameter fixed in the boiler at the opposite end to the fire door and chimney, with a fly-wheel to secure a rotatory motion in the crank at the end of each stroke, four wheels coupled together by spur-gear, and regulating blast pipe. It weighed four tons and a half, and was designed to travel on wooden rails hauling a load of ten tons and a half at the rate of four miles an hour.† A temporary way was laid down in the works “to let the quality

* *Newcastle Courant*, June 3rd, 1815.

† *Life of Richard Trevithick*, vol. i., pp. 182-186.

see her run," as one of the workmen afterwards stated.* The engine ran backward and forward quite well, but for some reason or other it was never delivered, and remained in the foundry as a fixed engine. John Steele, the engineer of the works, took a pride in showing the "iron horse" he had made, and it was probably examined by most of the men who afterwards came to the front in connection with steam locomotion. Robert Wilson, a Newcastle engineer, saw it on May the 1st, 1805, and made a note of some of the details,† and J. M. Oubridge, speaking at a meeting of the Cleveland Institution of Engineers on March the 1st, 1886, remembered to have seen it working.‡ Though never placed on a railway, its influence may be traced directly or indirectly on all its successors.

Trevithick's engine was too heavy for the plate-rail of the Welsh tram-road and too light to secure the adhesion necessary for taking such a load as would make it a more economical mode of traction than horses. The problem of adapting the locomotive engine to service was solved in 1811 by John Blenkinsop, the viewer of Middleton Colliery, near Leeds, a native of the North of England, born at Walker-on-Tyne. He devised a mechanical arrangement by which an engine no heavier than Trevithick's was enabled to exert a tractive power five times greater. This consisted of the addition to the engine of a cogged driving wheel, which worked into the projecting semi-circular lugs of a rack-rail laid down on one side of the waggonway. The engine was of "Trevithick's invention,"§ simple and compact in form, approximating to the "Catch-me-who-can" type of 1808; it had, however, two cylinders instead of one, an improvement suggested by Matthew Murray, of the firm of Murray, Fenton, and Wood, the makers. It cost £380, which included the premium of £30 paid to Trevithick in respect of his patent right.|| The first engine, the "Prince Regent," was tried on the Middleton waggonway on the 24th of June, 1812, and by the 12th of August both it and another, the "Salamanca," had begun working regularly across Hunslet Moor, from the foot of the inclined plane at the south corner of Hunslet Car to the Old Staith at Leeds, a distance of a mile and a half.

Trevithick's "travelling engine" of 1804 hauled a load of 25 tons at

* *Gateshead Observer*, quoted in *Life of Richard Trevithick*, vol. i., p. 186. † *Ibid.*

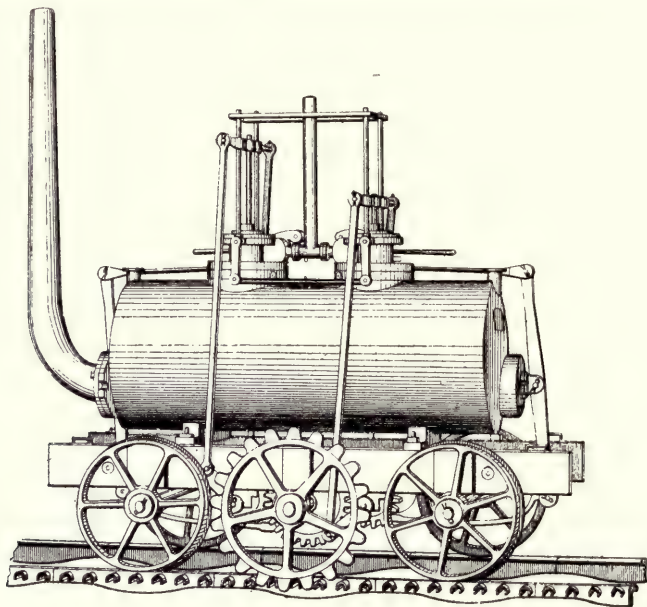
‡ *An Outline History of the Locomotive Engine (in England)* by Theodore West, 1887, p. 29.

§ John Watson to John Birtley, October 11th, 1813. *Watson Collection*, in Mining Institute, Newcastle.

|| *Ibid.*

the rate of nearly five miles an hour; Blenkinsop's "patent steam carriage" of 1812 drew 89 tons,* and afterwards proved itself capable of taking 110† tons at the rate of three miles and a half an hour.

Another portion of the waggonway, extending from the head of the inclined plane to the "Day Hole" Pit, was afterwards worked by locomotive power, two additional engines, the "Lord Wellington" and the "Marquis Wellington," being delivered in August and November, 1813.



BLINKINSOP'S ENGINE.

Blenkinsop's system, which added 30 pounds of metal to each yard of rail and increased the cost by 4s. or £352 per mile, was adopted on the Kenton and Coxlodge waggonway near Newcastle-upon-Tyne.‡

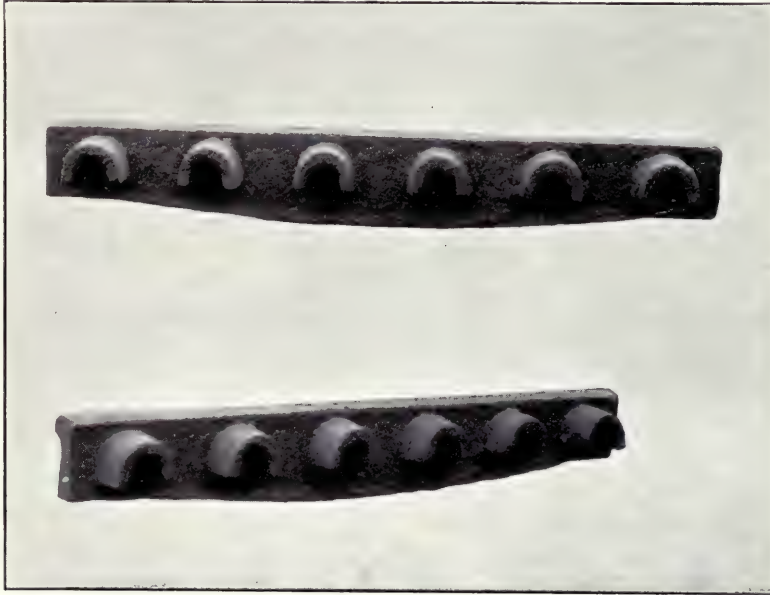
On this line, as there was a rise in the ground for a considerable distance from the pit, it was not deemed prudent to make the engines draw a greater

* John Watson to John Birtley, October 11th, 1813. *Watson Collection*, in Mining Institute, Newcastle.

† T. G. Cumming's *Illustrations of the Origin and Progress of Rail and Tram Roads*, 1824, p. 263.

‡ John Watson to John Birtley. *Watson Collection*, Mining Institute, Newcastle.

weight than 69 tons. With this load they continued to jog regularly to and fro over the Coxlodge, Gosforth and Benton grounds from the 2nd of September, 1813, to May, 1815, when, by mismanagement, supposed to have been connived at by the new agent of the colliery, on account of the engines interfering with the leading of coals by horses from Fawdon Colliery in which he was interested, they were rendered unserviceable and laid utterly aside.* On the Middleton waggonway they continued working until the



BLINKINSOP RAIL USED ON COXLODGE WAGGONWAY.

year 1834, exciting the interest of strangers, from the Grand Duke Nicholas (afterwards Czar) of Russia downwards. The greatest load one of these engines succeeded in drawing was 140 tons (38 waggons) at a rate of from two to three and a half miles an hour, a result achieved on the 16th of January, 1829.† There can be little doubt that as William Chapman, the eminent

* Depositions relative to Kenton and Coxlodge Colliery, 1816. *Ibid.*

† Rastrick's *Report to the Directors of the Liverpool and Manchester Railway*, dated 7th March, 1829, p. 45.

engineer, stated in 1824, "the first *useful* introduction of locomotive engines was by Mr. John Blenkinsop on the railway from Middleton Colliery to Leeds."*

The Wylam waggonway, a mile of which is now part of the North Eastern Railway system, was the scene of the next successful attempt to employ steam as a motive-power on railways. It furnished within the short space of two years a singular contrast. At Wylam in 1811, as at Blagdon in 1711,† oxen might have been found leading the coals: in 1813 locomotive engines were doing similar work over the same ground.

It was no doubt the eventful trial on Hunslet Moor which turned Mr. Blackett's attention once more to the locomotive engine, but however much he may have been impressed by the working of Blenkinsop's system, he was practically precluded from adopting it by having, but three years before, re-laid his waggonway with plate rails; these he could not replace by the ordinary and cogged edge rails under £9,000 for the five miles of road. He therefore reverted to the idea of trying Trevithick's engine. It was not definitely known at this time what relation the weight of an engine bore to the greatest load it was capable of moving from a state of rest. This point was determined about October, 1812, by William Hedley, the viewer, by means of an experimental carriage fitted with crank handles and spur wheels.‡ It was found that an engine light enough to travel over the Wylam tramroad could haul a profitable load by the mere adhesion of its wheels to the rails. An engine which does not seem to have differed in general design from that built to Mr. Blackett's order in 1805 was afterwards constructed by Thomas Waters, of Gateshead, successor to John Whinfield as Trevithick's agent,§ and put to work in the early part of 1813. From the fact of the boiler being of cast iron, and having a straight instead of a return flue, the engine went badly, "the obvious defect being want of steam."||

Another engine was then built at Wylam from Hedley's design, having a wrought-iron boiler with Trevithick's return flue and two vertical cylinders like Blenkinsop's engine. The cylinders, however, instead of being fixed in the middle of the boiler, one behind the other, were placed at

* *Letter to Sir James Graham on forming a communication between Newcastle and Carlisle, 1824, p. 5.*

† Morpeth Sessions Papers.

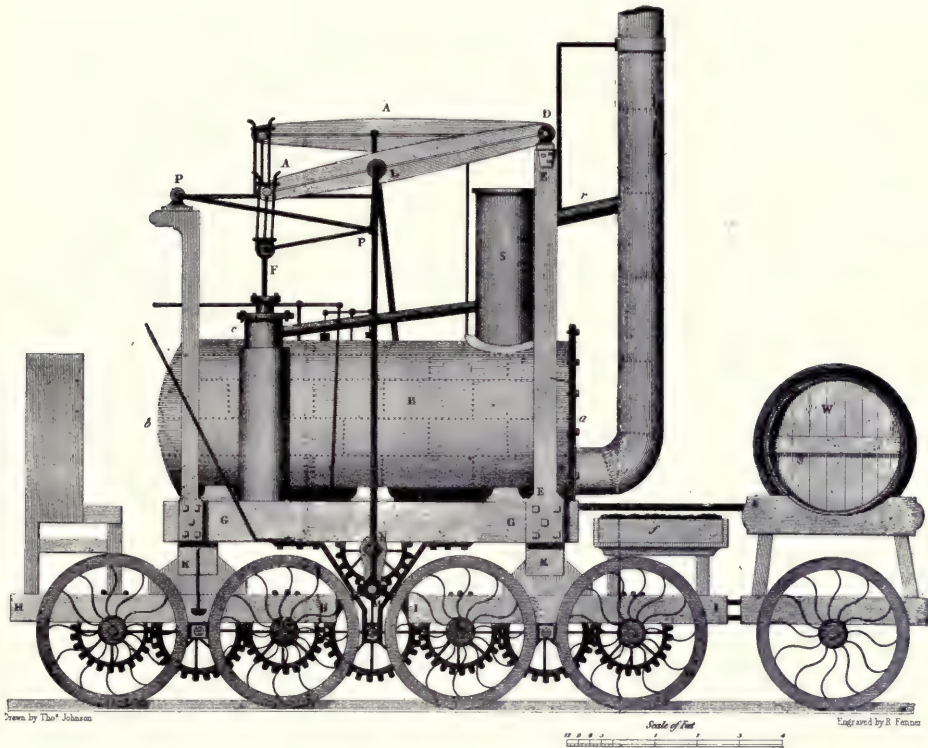
‡ Wm. Hedley's Letter to Dr. Lardner, 10th December, 1836.

§ *Newcastle Courant*, June 3rd, 1815.

|| Hedley's Letter to Dr. Lardner.

the end, and on each side of it. This arrangement made it necessary to substitute vibrating beams for the crossheads and guide-rods by which the action of the pistons was communicated to the wheels.

Hedley contributed no new feature himself to the locomotive engine; he merely added to one type what was distinctive of another, producing a third, which, as a practical application of the new motive-power, is entitled to historical recognition.



HEDLEY'S ENGINE, 1813 (AS REPRESENTED IN 1825).

It is evident from the specification of the patent which Hedley took out on the 13th of March, 1813, that he did not depend solely on the adhesion of the wheels to the rails. By means of teeth or flanges projecting from both sides of the wheels and entering the ground between the stones, sleepers or rails, the engine increased its grip on the level, while by the aid of a rope stretching from a post on the waggonway to a rope roll attached to

its own frame and worked by its own machinery it was enabled to pull itself up an incline. Mr. Hugh Taylor's reminiscences at the Stephenson Memorial Meeting of the 26th October, 1858, confirm this view. "At that early date it went by a sort of cog-wheel, then there was something of a chain to it. There was no idea that the machine would be sufficiently adhesive to the rails by the action of its own weight, but I remember a man going before—that was after the chain was abrogated—and scattering ashes on the rails in order to give it adhesiveness, and two or three miles an hour was about the rate of progress."* Three, at least, of these engines were constructed by William Hedley for the Wylam tramroad, and continued working till 1862, the "Old Duchess," now in South Kensington Museum; "Puffing Billy," in the Museum of Science and Arts at Edinburgh; and the "Lady Mary," which has gone to the scrap heap. One of these was inspected by the Archdukes John and Lewis of Austria when they visited Lemington on December 11th, 1815.†

The Heaton and Newbottle waggonways have only an indirect connection with the progress of steam locomotion, but they must be noticed for two curious experiments which were made upon them, experiments of use, perhaps, as showing in what directions the true development of the locomotive engine did not lie.

The first of these was with William Chapman's chain engine, which was patented on the 30th of December, 1812, and tried on the Heaton waggonway, so it is stated, in October, 1813.‡ His method was a simple one. Over a sprocket wheel connected with the working gear of the engine was laid a chain stretched along the waggonway and secured at each end. When the wheel revolved it pulled, as it were, at the chain and drew the engine with its train of waggons forward.

The second was with William Brunton's "Mechanical Traveller," a curious machine, patented May 22nd, 1813, which obtained its progressive motion by an ingenious combination of levers acting somewhat similarly to the legs of a man in walking. It worked during all the winter of 1814

* *Newcastle Journal*, 30th October, 1858.

† Richardson's *Table Book*, vol. iii., p. 159.

‡ O. D. Hedley, *Who invented the Locomotive Engine*, 1858, p. 9. The Heaton waggonway at this time ran in a south-easterly direction from the "High" or "E" pit, situated a little west of the present Byker and Heaton Cemetery, past the "Middle" or "C and D" pit to the "Engine" or "A and B" pit, the site of which is occupied by the N.E.R. sidings near the carriage-washing sheds at Heaton Junction. It then proceeded in a south-westerly direction across the North Shields Road—a few yards to the east of the Two-mile Houses—to the Lawson Main pit, from which point its course was first S.E. and then S. to St. Anthony's Quay—a total distance of 3 miles 258 yards.

on the Newbottle waggonway, between the "Margaret" Pit and West Herrington, a distance of about two miles, but on the 31st of July, 1815, at Philadelphia a new boiler which had been fitted to it exploded, killing 16 persons and injuring about 40 more.*

As the engine at this early period was already too heavy for the existing rails without the additional load of a chain, William Chapman devised the plan (described and illustrated in the specification of his patent of December 30th, 1812) of distributing the weight over six or eight wheels by placing in the one case two-thirds, and in the other one-half, of it on a bogie-frame which turned on a pivot in order to "move freely round the curves and past the angles of a railway."† On the 21st of December, 1814, one of Chapman's engines (built by Phineas Crowther, of the Ouseburn Foundry, Newcastle-upon-Tyne), the first bogie engine of which there is any written description, was set to work on the Lambton waggonway, drawing 18 loaded coal waggons, weighing about 54 tons (exclusive of its own weight, nearly 6 tons), up a gradient of 1 in 115, at the rate of four miles an hour.‡

From Wylam it is necessary to pass to West Moor, to a waggonway constructed in the early years of the nineteenth century by the same famous partnership which formed the Tanfield line, in order to follow the development of the locomotive engine.

The reasons for adopting steam traction were equally potent at the one place as at the other, and the owners of Killingworth Colliery decided to submit the new motive-power to a trial. The suggestion probably came from George Stephenson, the newly-appointed enginewright of the "High" Pit, who, it is known, had visited the Wylam and Coxlodge waggonways to see the engines at work.§

Having made a few experiments as to the adhesion of wheels running on round topped rails,|| he set about the construction of his first engine, which was tried on the 25th of July, 1814. By the 8th of October, when the *Newcastle Courant* drew public attention to the fact, it had begun travelling regularly over Killingworth Moor to a point about two miles distant from the Colliery,

* Whellan & Co.'s *Directory of Durham*, 1894, p. 826; and *Tyne Mercury*, August 8th, 1815; *Durham Advertiser*, August 5, 1815.

† *Repertory of Arts, Manufactures, &c.*, February, 1814, p. 139.

‡ *Ibid.*, February, 1815, pp. 161-162; also *Tyne Mercury*, January 3rd, 1815.

§ *Lives of Eminent Engineers*, by Smiles, vol. iii., pp. 94-95.

|| *Address on Two Eminent Engineers*, by N. Wood.

drawing 16 waggons, or a weight of 56 tons, up an inclination of 1 in 450 at the rate of about three miles an hour, and the 50 horses which had previously been employed in the leading of the coals were soon reduced to 30.*

Stephenson seems to have been more struck with the general design of Blenkinsop's engine than Hedley's, and his own was practically a copy of it, though instead of effecting locomotion by means of a cogged driving wheel, he geared the axles together and used the combined adhesion of the four wheels for this purpose.

To increase the efficiency of the locomotive engine became from this time forward the chief concern of Stephenson's life. On February 28th, 1815, in conjunction with Ralph Dodd, the viewer, he took out a patent for various improvements, which consisted in applying the power directly to the wheels by attaching the connecting-rod to a pin upon one of the spokes, a ball and socket joint being used for the purpose, and coupling the axles together with an endless chain passing over cogged wheels. The second Killingworth engine which was set to work shortly afterwards, on the 6th of March, 1815, was of this construction, and differed from the first in the arrangement of the cylinders, one being placed at each end of the boiler. According to Mr. Nicholas Wood it was found to work remarkably well.†

During the following year Stephenson made an important series of improvements in the whole machinery of conveyance—engines, rails, chairs, etc. Conjointly with William Losh, the senior partner in the firm of Losh, Wilson & Bell, who employed him at this time two days a week at their Walker Ironworks, he took out a patent to cover these inventions, and the date of it, September 30th, 1816, is one to be remembered in the history of railways.

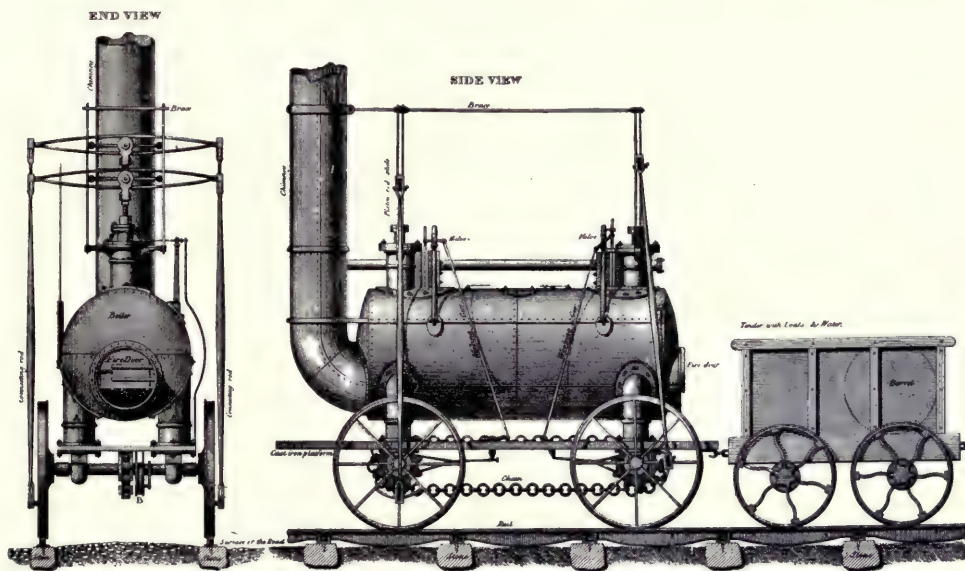
The problem that had so far faced Stephenson, together with the other pioneers of steam locomotion, was how to adjust the weight of the engine to the strength of the rails, and this he solved by means of steam-bearing cylinders fixed to the lower part of the boiler. Any oscillation produced by the inequalities of the road was transferred from the axles, through the agency of rods connected with them, to solid pistons in the cylinders, which, acting against the pressure of steam, performed the office of springs.‡ The weight was distributed equally over the wheels, and less injury was done to

* *Newcastle Courant*, October 8th, 1814. † Wood's *Treatise on Railroads*, 1838 ed., p. 291.

‡ *Lecount's Practical Treatise on Railways*, 1839, p. 355.

the rails and the working parts of the machinery by violent shocks. It was possible from this date still further to increase the weight of the locomotive engine, and, as a consequence, augment its power.

This ingenious substitute for springs was considered a noteworthy feature of the Killingworth engines as late as March, 1822;* the engines which opened the Hetton waggonway on the 18th November, 1822, had it, though springs were already in use, a large engine on the Heaton waggonway having been furnished with them previous to November, 1821.†



G. STEPHENSON'S PATENT LOCOMOTIVE ENGINE.

From Strickland's 'Reports on Canals, Railways,' etc., 1826.

The fame of the Killingworth enginewright began to be noised abroad. In the course of an interesting article on "Railways in England," Monsieur de Gallois, a French mining engineer, who had spent some months in the neighbourhood of Newcastle in 1816 and 1817, made a special reference to Stephenson's Killingworth engine, giving particulars of its powers.‡ "Some of the most striking improvements in the system of railways," wrote Mr. R. Stevenson, of Edinburgh, in 1818, "are the patent inventions of Mr.

* Nicholas Wood in *Newcastle Magazine*, April, 1822, p. 207.

† Letter from Wm. Losh to Edward Pease, November 3rd, 1821.

† *Annales des Mines*, vol. iii., 1818, p. 133.

Stephenson, of Newcastle, particularly his Locomotive Engine, by which 50 tons of coal and upward are at one load conveyed several miles along a railway by the force of steam.”* A similar opinion was held by William James, the original projector of the Liverpool and Manchester Railway, and even more warmly expressed in a letter to a member of the Darlington Committee dated June 22nd, 1821. “The locomotive engine of Mr. Stephenson is superior beyond all comparison to all the other engines I have ever seen. Next to the immortal Watt I consider Mr. Stephenson’s merit in the invention of this engine.”†

To the Killingworth waggonway the projectors of the early lines were not only indebted for an engine capable of working efficiently and economically, but for the first reliable railway statistics.

In October, 1818, experiments were begun by George Stephenson and Nicholas Wood‡ and continued by the latter (who also was to play an important part in the development of railways as author of the first scientific treatise on railroads, and the engineer of one of the lines now merged in the North Eastern Railway) with a view of ascertaining the resistance presented to the motion of carriages on railroads, the drawing power of horses and locomotive engines, the durability of rails, the consumption of fuel by engines at different speeds, etc., and it must be regarded as a fortunate circumstance that two such remarkable men should have been drawn so closely together at Killingworth Colliery at such an eventful period.

West Moor soon became a place of pilgrimage. Hither came Robert Stevenson, of Edinburgh, in January, 1819,§ to make experiments on the draught of horses. He was followed by William James|| and his son, William Henry James, ¶ in 1821; by Edward Pease and some of the directors of the Stockton and Darlington Railway, probably in 1821;** by Charles Sylvester in 1823†† and T. G. Cumming‡‡ in 1824, to see and write about the performances of the engines; by 12 members of the Committees of the proposed Liver-

* *Report on Edinburgh Railway*, 1818, p. 26.

† *Railway Collection* in Public Library, Newcastle-upon-Tyne.

‡ Wood’s *Treatise on Railroads*, 1838, p. 358.

§ Benjamin Thompson’s *Journal*, January 29th, 1819.

|| William James to one of the Stockton and Darlington Committee, June 22nd, 1821.

¶ George Stephenson to Wm. James, postmarked December 20th, 1821.

** N. Wood’s *Address on Two Eminent Engineers*, p. 25.

†† *Report on Railroads*, 1825, pp. 7-8.

‡‡ *Illustrations of the Origin and Progress of Rail and Tram Roads*.

pool and Manchester and Liverpool and Birmingham Railways, in 1825;* and a few years later by James Walker and J. U. Rastrick and others.

While the details of the new system of internal communication were being worked out on Killingworth Moor an agitation had already begun against the existing means of conveyance: the pack horses moving in gangs of thirty or forty along the rough winding roads, the lumbering road waggons of Pickford, Pickersgill and other carriers, the splendidly appointed stage coaches—not unfrequently attaining a speed of 12 miles an hour†—had proved inadequate to the commercial needs of the country, and old schemes for water transport were revived in the North of England, the two principal ones being a canal from the Auckland coal-field to Stockton, and a canal from Newcastle to Carlisle. But capital hesitated and hung back, and rightly so: far-seeing men had pointed out the superior advantages of the iron railway. Foremost among these was William Thomas, of Denton Hall, who, in a paper read at a monthly meeting of the Literary and Philosophical Society of Newcastle-upon-Tyne on the 11th of February, 1800, proposed to substitute for a canal from Newcastle to Hexham a cast-iron tramroad, which would not only accommodate coal and merchandise waggons but “the more light and expeditious carriages, such as coaches, post chaises, etc.,”‡ thus making the first suggestion of passengers travelling by rail. Two years later Richard Lovell Edgeworth recommended the laying down of four lines of railway on one of the great roads out of London, two of them for coal waggons and two for light carriages, estimating that the stage coach would then go from London to Edinburgh in 30 hours.§ Then, in 1820, came Thomas Gray, a native of Leeds, with his comprehensive plan for a “General Iron Railway or Land Steam Conveyance to supersede the necessity of horses in all public vehicles,” a plan evincing remarkable prescience, which he advocated with all the energy of a railway enthusiast, proposing even that it should first be tried between Manchester and Liverpool.

To the district controlled by the North Eastern Railway, however, was reserved the honour of inaugurating the railway system: it was not between Liverpool and Manchester, but between Witton Park Colliery and Stockton that the first section of this general iron railway was eventually laid, though many years earlier it seemed as if the first line would have been

* *Mechanics' Magazine*, 1825, pp. 312-313.

† The Old North Road, *Arch. Ael.*, N.S., vol. iii., pp. 254-255.

‡ *Observations on Canals and Railways*, by Wm. Thomas.

§ *Leeds Mercury*, August 21st, 1802, quoted in Mayhall's *Annals of Yorkshire*, vol. i., p. 204.

constructed between Spittal, near Berwick, and Kelso, under an Act obtained for this purpose in May, 1811, which is noteworthy as containing the first clause relative to the conveyance of passengers.

The North of England has many glorious associations, and not the least memorable of these are the incidents connected with the introduction of the railway system. Among its objects of interest future generations will assuredly place the old waggonways on which steam power was first applied to purposes of traction, and among its men of mark will be remembered those who made the railway system practicable: John Blenkinsop, born at Walker; William Hedley, at Newburn; George Stephenson and Timothy Hackworth, at Wylam; Robert Stephenson, at Willington Quay; Nicholas Wood, at Daniel, near Wylam; William Chapman, at Whitby; together with those who assisted in its early development: John Urpeth Rastrick, one of the judges at the trial of locomotive engines at Rainhill, a native of Morpeth, whose engine, the "Agenoria," opened the Shutt End Railway on June 2nd, 1829; Sir Daniel Gooch, who imbibed his earliest railway knowledge from the lips of George Stephenson and Joseph Locke at his native place, Bedlington, and received his first strong impression of steam traction from a locomotive engine travelling on the turnpike road near Morpeth on the 8th of September, 1829, an engine built by Messrs. R. and W. Hawthorn for Mr. R. Robson of Alnwick and North Sunderland, to work and draw a thrashing machine; Thomas Tredgold, the author of early works on railroads and carriages and the steam engine, born at Brandon; Matthew Murray, the builder and improver of locomotive engines, born at Stockton; Thomas Gray, the awakener of public interest in railways, born at Leeds; and the far-seeing projectors of the first public line on which locomotive power was used, the Stockton and Darlington Railway.



BEDLINGTON IRONWORKS.

CHAPTER I.

CANAL SCHEMES THAT BROUGHT FORTH RAILWAYS.

Lord Harley, travelling northward in 1725, met, near the village of Cockerton, several "gangs" of packhorses and asses carrying coals in sacks from Etherley to Darlington. As the average load was a little over two bushels, it must have required from ten to twelve animals to convey a ton of coals. The cost of carriage was, in all probability, the difference between 5s. 4d. ($2\frac{1}{2}$ d. a bushel), the price at the pit's mouth, and 17s. (8d. a bushel), the price at Darlington, a dozen miles away.*

How to reduce this cost was a problem of the first importance to the coal-owners of South-west Durham and the manufacturers of Darlington, Stockton and Yarm, yet it was not solved for a hundred years.

Lord Harley, between Chester-le-Street and Birtley, and Dr. Stukeley, a few months later, at Tanfield, saw the early working of the system by which cheap transport was afterwards to be effected; but, while the railway was in process of evolution, the introduction of another method of conveyance diverted public attention from it for more than half a century.

The success of the Duke of Bridgewater's canal, which was opened between Worsley and Manchester in 1761, led to a remarkable development of inland navigation. The triumph of water conveyance was almost universal. Even in the heart of the waggonway district estimates were made in 1764 for a navigable cut between Lemington and Wylam.† Public interest in canals rose to fever heat in 1767, when James Brindley completed, to the upper part of Runcorn, the second portion of his great work; and yet—a coincidence to be noted—the same year William Reynolds laid the first iron road at Coalbrookdale.

Three of the navigations sanctioned by Parliament and executed between 1767 and the railway era, viz:—The Ripon Canal (Act 7 Geo. III., c. 93. R.A. 15th April, 1767); the Market Weighton Canal (Act 12 Geo. III., c. 37. R.A. 21st May, 1772); and the Pocklington Canal (Act 55 Geo. III., c. 55. R.A. 25th May, 1815) have come into the possession of the North

* *Hist. MSS. Commission*, MSS. of the Duke of Portland, vol. vi., p. 100.

† *Views and Borings (1764-1769)*, vol. ii., pp. 79 and 80, in the custody of the Society of Antiquaries of Newcastle-upon-Tyne.

Eastern Railway and, with the Derwent Navigation (Act 1 Anne, c. 20. R.A. 6th May, 1702), also acquired by the Company, represent a total expenditure of nearly £108,000.*

Others projected during the same period, but not executed, eventually led to the formation of some of the earliest lines in the North Eastern Railway system.

The first of these was a canal from the coal-field of South-west Durham to the navigable waters of the Tees. In October, 1767, this project formed the engrossing topic of conversation in Darlington. The first meeting of the promoters was held in that town on the 9th of November, and, on the 1st of December a committee, numbering among its thirteen members representatives of the Backhouse and Pease families, was appointed for the ordering of a survey. The great Brindley was asked to send them a competent person to undertake the work, and in August, 1768, he directed one of his own surveyors to proceed to Darlington. This was Robert Whitworth, who, in a report dated the 24th of October, recommended a line of canal from Winston, by Killerby and Darlington, to Stockton-on-Tees, with branches from Thornton to Piercebridge, from Darlington to Croft, and from Coatham Stob to Yarm. For the first half-mile or so, it is interesting to note, the canal was to pass through land belonging to the Duke of Bridgewater.

The canal and its branches, thirty-three miles and a half in length, it was estimated would cost £64,000.

Brindley went over the ground, and confirmed the eligibility of Whitworth's line and the accuracy of his estimates.

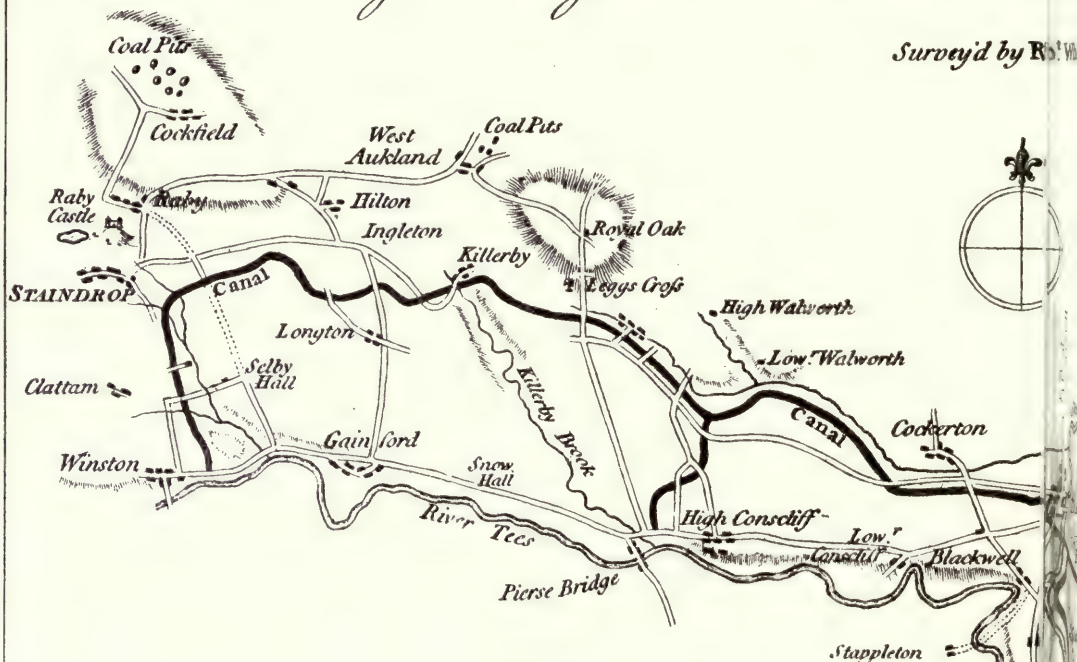
A joint report by the two engineers, dated 19th July, 1769, was considered at a meeting held in Darlington, when it was suggested by Mr. George Dixon, of Cockfield, that a branch might be formed from Railey Fell Colliery, through the collieries of Greenfield, West Auckland, Ramshaw, Norwood, Butterknowle and Cockfield Fell, without a lock, to the top of the bank above Morton, the coals from this point to be conveyed to the main canal down a self-acting inclined plane.† A survey for the proposed branch

* The Ripon and Market Weighton canals were surveyed by the celebrated John Smeaton, the execution of the one being carried out by John Smith, and that of the other by Robert Whitworth. A short branch to the Market Weighton canal—a little over half a mile in length—called "Sir Edward Vavasour's Canal" or the "Holme Canal," was formed half a century or so later, under the powers of the Act of 1772, but though powers to acquire it were obtained by the York and North Midland Company in their Act of 1847 these were never exercised. The Pocklington canal, which was opened at the very close of the canal era on 30th July, 1818, was surveyed by George Leather of Leeds, and executed under his superintendence.

† *Bailey's View of the Agriculture of the County of Durham*, 1810, p. 277.

A Plan of the River Tees, and of the by Darlington to Winston, in the

Survey'd by R. S. V.

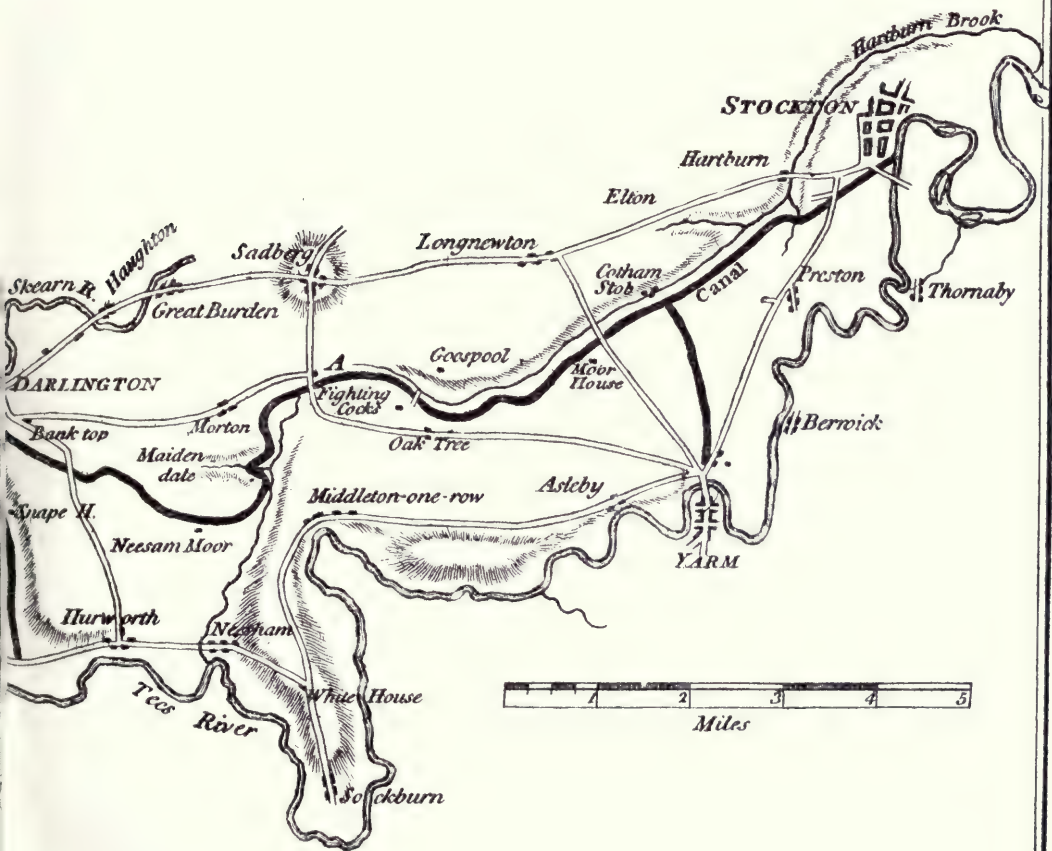


	M. F. Ch.	F. I.
From Winston to Killerby.....	4 - 7 - 272	— — —
Killerby to Darlington.....	8 - — - 1	187 - — Fall
Darlington to A.....	5 - 6 - 694	— — —
A to Stockton.....	8 - 1 - 367	141 - — Fall
Branch to Pierse Bridge.....	1 - 5 - 925	— — —
D ^o from Darlington to Croft Bridge.....	3 - — - 821	— — —
D ^o from Cotham Stob to Yarm.....	1 - 6 - 863	— — —
	<u>33 - 4 - 942</u>	<u>328 - — Fall</u>

This Branch is upon a Level 20 ft
below the Level of that Part of the
Canal from whence it is taken

*intended NAVIGABLE CANAL from Stockton
Bishoprick of Durham.*

hitworth.



was shortly afterwards made, and the probable cost estimated at £8,000. A plan of the canal showing not only this branch, but also one from Cockfield Fell to Keverstone, with a waggonway connection between it and the main canal near Staindrop, was published in 1770, but still the inhabitants of South Durham, favourably disposed as they were to the scheme, did not come forward with their subscriptions, fearing that the tolls would not yield a sufficient interest for their money. By August, 1772, according to an article which appeared, with a plan to illustrate it, in the *Gentleman's Magazine* for that date, these apprehensions were "pretty well over," the calculations of revenue, by gentlemen acquainted with the district, having proved, it was stated, beyond a doubt, that the undertaking would pay as well as any canal in the kingdom, one only—at Birmingham—excepted.* The project was kept before the public, but from one cause or another no further progress was made with it.

Another movement for a waterway, anticipating that for a railway, sprang up in the southern part of the North Eastern Railway territory in 1769, and Brindley made a survey for a canal, twenty-three miles in length, from the river Ouse at Selby to the proposed Leeds and Liverpool canal at Holbeck, Leeds, passing near Thorpe Hall, Hambleton, Hiliam, Burton Salmon, Fairburn, on the north side of the Aire (which it crossed south of Swillington), and near Thwaite and Hunslet on the south side of that river. In 1772 application was made to Parliament for the necessary authority to construct it, but, owing to the opposition of the Aire and Calder Navigation, the bill was dropped in 1773. After a resurvey of the line the promoters once more brought forward a bill, but the same powerful influence defeated the measure. A plan of the proposed canal appeared in the *Gentleman's Magazine* for August, 1774, accompanied by a short article pointing out the public utility of such a line of communication, but the project was never revived, as the Aire and Calder Navigation, having obtained that year the necessary powers, proceeded to make a branch canal from the river Aire at Haddlesey to Selby, which they opened for traffic on the 29th of April, 1778.

Twenty years after the collapse of the Leeds and Selby scheme, two canals were projected in the North Riding of Yorkshire through the districts now served respectively by the Whitby and Pickering, and Scarborough, Pickering and Malton lines. The one, surveyed in 1793 by William

* *Gentleman's Magazine*, 1772, p. 352.

Crossley, and estimated to cost £66,447, followed a winding course from Ruswarp to Pickering, by Grosmont, Beckhole and Newton Dale, for twenty-five miles; the other, surveyed by a Mr. Cockshutt in 1794, and estimated to cost £71,087, ran from Scarborough to the Costa rivulet, near Malton, with branches to Pickering, Malton and How-Keld-Head Mill, a total length of thirty-five miles and a half. Both projects fell through and were shortly afterwards abandoned.

In 1794 began the agitation out of which sprang the Newcastle and Carlisle Railway. As early as 1778 Smeaton had reported on the practicability of a canal on the south side of the Tyne from Stella, by Ryton, towards the grounds opposite to Wylam, but such a scheme formed but a fractional part of that which, in 1794, was proposed for connecting the East and West Coasts.

The idea of a water communication from sea to sea appears to have originated with Ralph Dodd, C.E., who, having made a superficial survey of the route of the intended canal, laid his plan before a meeting held in Newcastle-upon-Tyne on the 1st of November, 1794.

The line he recommended followed the bed of the river as far as Lemington, from which point the entrance of the canal was to be approached by means of a cut across the intervening neck of land. From Stella he proposed to continue the navigation on the south side of the river to Hexham. This portion he suggested should be executed first.

It was decided to have the opinion of another engineer on the subject of the canal, and William Chapman was directed to make a survey of a line of navigation from Newcastle to Carlisle, and from that city to the most eligible port on the Irish Channel. His plan, as elaborated in a series of reports dated 5th January, 26th June and 10th July, was for a canal of ninety-three miles and a half extending from a wet dock near the Ouseburn Bridge at Newcastle to Maryport; its course, after reaching a point behind Percy Street and Gallowgate, being along the north side of the Tyne valley to Haydon Bridge, a distance of thirty-two miles, without the interruption of a single lock, past Haltwhistle, Glenwhelt, Gelt Bridge to St. Nicholas, near Carlisle, and thence, by way of Kirk Andrews and Gamblesby, to the terminus, with collateral cuts up the valley of the South Tyne towards Alston Moor, and up the valleys of the Eden and Eamont towards Penrith.

While Chapman was preparing his second report Dodd, the advocate of the southern line, communicated the results of his own survey in a report

dated the 5th of June, which was not without its effect on the committee of subscribers. The line was admitted by Chapman to be practicable, and even to possess some advantages as a separate undertaking, but he saw no reason for adopting it in preference to the northern line.

William Jessop was now called in, and his opinion, submitted on the 26th of October, was that "no better general line would be found than that laid down by Mr. Chapman." The cost of this canal was estimated by Jessop and Chapman at £355,067. This was a formidable sum to raise, and the subscribers to the survey deemed it expedient to limit the scheme to a canal between Haydon Bridge and Newcastle.

Opinions being divided between the rival lines, it was decided to have another survey made. John Sutcliffe, the engineer selected, while in favour of a canal on the south side of the Tyne, disapproved of Dodd's line, and in his report dated 5th October, 1796, proposed one of his own from Hexham to Stella, holding out flattering prospects of tonnage from coal, lead, etc., and comparing the canal favourably with existing navigations paying 30, 35, 80 and even 100 per cent. profit.

This report he followed up with a second, dated 3rd January, 1797, in which he continued his line of navigation to Haydon Bridge, estimating the cost of the whole canal from Newcastle to Haydon Bridge at £162,059.

An examination of Sutcliffe's and Chapman's lines was made by Robert Whitworth, who, in his report dated 23rd February, 1797, suggested a few alterations, and revised the estimates. On the 16th of March an expression of opinion was obtained from him that the line on the south side had certainly very much the advantage, both in point of tonnage, expense and safety in the execution. This was a weapon in the hands of the south-line party, and when a bill, which had already been brought before the House of Commons, for a canal between Newcastle and Haydon Bridge, on the north side of the Tyne, reached the committee stage, it was so strongly opposed that the promoters decided to withdraw it.

In this period of two or three years, during which the canal had occupied public attention on the banks of the Tyne, similar projects had been discussed on the banks of the Tees and Wear, and in these Ralph Dodd was the moving spirit.

One was for amending and extending the powers of an Act passed in 1759 for continuing the navigation of the river Wear from Biddick Ford to the city of Durham, and for making and maintaining a navigable canal from the same river near Picktree to the Tyne at Redheugh, with a collateral

branch to Kyo West Houses, and notice of application to Parliament for a bill to carry this scheme into effect was given in September, 1796; the other was for the old Winston to Stockton canal and its branches, the scope of which was extended by a branch northward to connect with the proposed Durham canal, and a branch southward from Croft Bridge to Thirsk, Northallerton and Boroughbridge. Dodd, in a report issued in 1796, painted a glowing picture of the profits which might be expected from this canal, but it had little effect on the subscription lists.

The scheme for extending the Wear navigation to the city of Durham was taken up again in 1797 when Robert Whitworth made a report in favour of a proposed canal from Chester-le-Street to Durham, estimating the cost at £79,000. Meanwhile the advantages of a canal to Boroughbridge, as suggested by Dodd in the second of the above schemes, were not lost sight of, and, in the early part of 1800, a North-Riding canal was projected and surveyed between the months of April and October by George Atkinson.

This canal, as described in his report, commenced by a junction with the Ure, a little below Ellinthorpe Chapel, near Boroughbridge, and took nearly the same direction northward as the present main line of railway, but a mile or two to the west of it, past Newby Wiske, Hutton Bonneville and Cowton to Piercebridge. Branches were to strike off to Bedale and Richmond on the one hand, and to High Worsall on the other. The cost of the trunk canal (forty-two miles and a half in length) was estimated at £61,650, and that of the three branches (twenty-seven miles) at £45,703: total £107,353. The branch to the Tees, it was suggested, "would prove a substitute for the canal so much wished for by the gentlemen of the counties of Durham and York about the year 1768."*

The Tyne and Beamish canal, up the Team valley, which by September, 1803, had met with so much support that the promoters announced their intention of applying for an Act in the next session of Parliament, was one of the last to be brought forward in the North of England before the close of the canal era.

Had all these projects for canals been carried into effect, it is evident what a complete system of inland navigation they would have formed; how, in conjunction with the principal rivers, they would have approximated to the main lines of the early railways in the North of England,

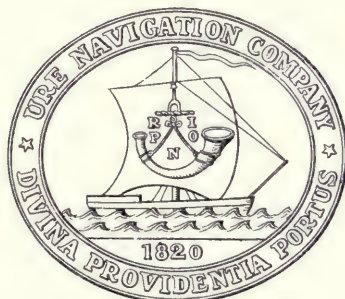
* *Report of the Proposed Great Trunk of Canal from near Boroughbridge to Piercebridge, with various Collateral Branches to the Tees near Worsall, also to Richmond and Bedale in the North Riding of the County of York, 1800. By George Atkinson (Richmond).*

and tapped the same sources of traffic. It would have been possible to travel by water from Maryport to Hull, and fly-boats might have carried excursionists from Leeds to Scarborough and Whitby. Alston lead might have been conveyed in barges to Newcastle, and the manufactured goods of Tyneside sent similarly to Northallerton, Thirsk, Bedale, Richmond and Ripon, in exchange for the agricultural produce of the North Riding. There was no town of any importance in Durham or North Yorkshire which might not have been supplied with Windsor's Pontop or Etherley Wallsend coals, and the merchandise and other commodities brought into the ports of the North-east Coast could have been distributed throughout the same area with equal facility.

It is impossible to pass in review all these elaborate canal-schemes—schemes that would have involved an expenditure of over three-quarters of a million of pounds—without a feeling of regret that so much public spirit, business enterprise and engineering skill should have come to nothing.

But the failure of the canal meant the triumph of the railway.

One result of the labours of the canal projectors was to make clear what were the chief traffic-routes of the North, and, in the numerous plans and reports that had been published, the railway engineer found full information as to the nature of the ground to be traversed, and the probable sources of revenue.



CHAPTER II.

INCEPTION OF THE STOCKTON AND DARLINGTON RAILWAY.

[1810-1821.]

The first public suggestion of a railway in South Durham was made on the 18th of September, 1810, at a dinner held in the Town Hall, Stockton, under the auspices of the Tees Navigation Company, to celebrate the opening of the "New Cut"—a short canal 210 yards in length, across a part of the "Holmes"—which shortened the navigation of the river between Portrack and Stockton by two miles and a quarter. It occurred in the form of a resolution moved by Leonard Raisbeck, the Recorder of Stockton, and seconded by Benjamin Flounders, of Yarm, that a committee should be appointed to "inquire into the practicability and advantage of a *railway* or canal from Stockton, by Darlington and Winston, for the more easy and expeditious carriage of coals, lead, etc." In the minds of the framers of the resolution the idea of a railway was apparently uppermost.

The committee took a year to consider the matter, and the result of their deliberations and inquiries was, that either "a canal or railway"—the railway being now the alternative—"would not only be productive of considerable advantage to the country in general, but would likewise afford an ample return to the subscribers." These views were embodied in a report which was presented at a meeting held in the King's Head, Darlington, on the 17th of January, 1812, when it was decided to ask Rennie to report on the best method of communication. The services of the famous engineer, however, were not available until the summer of 1813, when he spent seven days in examining the country generally between Stockton and the Auckland coalfield, without being at all restricted in his survey. His opinion was favourable to a canal, while, as to the direction it should take, no better line, he thought, could be adopted than Whitworth's. His estimate, dated 13th August, 1813, was higher than any which had previously been given. The cost of a canal, 16 feet wide at the bottom, 31 feet wide at the top, and 4½ feet deep, he calculated would amount to £205,618, viz.:—

				£
Main Line—Stockton to Darlington	...	...	...	95,600
Do. Darlington to Winston	...	...	...	83,978
Total	...	...	...	£179,578

	£
Branch—To Yarm	8,256
Do. To Croft Bridge	10,016
Do. To Piercebridge	7,768
	<hr/> 26,040
Total	£205,618

Submitted at a critical period in English history, when the wars with France and the United States of America were exhausting the resources of the country, and money was consequently scarce, this estimate of Rennie's was practically prohibitive. The commercial depression and high prices of materials which were driving some of the northern coal-owners to experiment with the locomotive engine in order to lessen the cost of transport were fatal to the prospects of a canal. It was not until after the Treaty of Paris and the Peace of Ghent that any further action was taken. On the 7th of February, 1815, the subscribers to the survey were called together to take Rennie's report and estimate into consideration. A few months later—in July—all further proceedings were, for a time, rendered hopeless by the failure of Messrs. Mowbray, Hollingsworth and Company's bank, which involved many commercial houses in the county of Durham in ruin. The project, however, continued to occupy men's thoughts, and the idea of a railway was gradually making headway. In 1816 there was a suggestion to utilise both canal and railway for communicating between the collieries and Stockton—a canal to connect Stockton and Darlington and a railway to continue the communication from Darlington to Winston. Rennie's estimate for the former, in 1813, was £95,600, and for the latter, in 1816, £45,860—altogether £141,460 as against £179,578 for the canal alone. As it afterwards appeared desirable that the railway from Darlington should not go so far out of the direct line towards the collieries as Winston, a new survey was directed to be made for a railway from Darlington to a point near West Auckland.

The project, as now conceived by some of the more active members of the committee, was no longer for "a canal *or* railway but for a canal *and* railway," and in this duplicate form it remained for nearly two years, during which period there was much activity among the canal-promoters of the North of England. Meetings were held in Newcastle, Carlisle and Knaresborough, and resolutions passed in favour of canals. Between October, 1817, and May, 1818, three eminent engineers were at work surveying for proposed waterways in the northern counties—William

Chapman between Carlisle and Knock's Cross or Fisher's Cross, with instructions strictly "to adhere to the great ultimate object of connecting the east and west seas"; Thomas Telford between Knaresborough and the Wharfe, near Tadcaster; and George Leather between the Tees and the Gaunless.

George Leather's survey was undertaken at the expense, and under the personal direction, of Christopher Tennant, a public-spirited inhabitant of Stockton, who had come to the conclusion that the Tees might compete successfully with either the Tyne or the Wear in the exportation of coals. The instructions he received were simply "to survey the country so as to point out the *lowest*, least expensive, and shortest practicable line for a canal from the river Tees into the present working coal-field";* so, ignoring Darlington, he recommended a line of canal considerably to the north of that proposed by Whitworth, Brindley and Rennie. Leaving the Tees below Portrack, it took a north-westerly direction past Norton, Blake-stone, Thorpe, Witton, Stillington and Elstob to Mordon Carrs, and, after crossing the Skerne near Bradbury, ran in a south-westerly direction past Rushyford, Windlestone, Eldon, Shildon, Thickley and Brusselton to the Gaunless near Evenwood Bridge, a course of twenty-nine miles and a half. The cost of this canal, which was to be twenty-four feet wide at the bottom, from forty-two to forty-eight feet at the top, and six feet deep, with fifty locks, was estimated at £205,283. A survey was afterwards made for a branch nine miles and three-quarters in length from Bradbury to the city of Durham, estimated to cost £35,812.

In compliance with a requisition which was numerously signed between the 14th of May, 1818, and the end of June, the Mayor of Stockton summoned a public meeting for the 31st of July to take into consideration the expediency of forming the proposed Stockton and Auckland canal. The people of Stockton, having had the reports of the engineer and the explanations of the projector laid before them at a preliminary meeting held on the 9th of July, threw themselves into the scheme with enthusiasm, and when, on the day fixed by the Mayor, they assembled in their hundreds in the Town Hall under the presidency of the Earl of Strathmore, they felt little inclination to listen to counsels of delay and suggestions of further inquiry and investigation, even from the lips of their respected Recorder, and they proceeded to pass a series of resolutions in support of the new line of canal, and in favour of an early application to Parliament for powers to construct it.

* A further report from George Leather, engineer, on the Stockton and Auckland canal, 1818, p. 11.

While Stockton was jubilant and hopeful, Darlington was uneasy and despondent. Five years previously Rennie had damped the ardour of the leading advocates of the canal, for whom he was then making a survey, by an expression of opinion that they would not for many years receive an adequate return for their capital.* He had confirmed their conclusions with regard to the shipment of coals from the Tees, that it would be impracticable to establish an export trade while so many inconveniences existed in the navigation of that river. Darlington had, therefore, lost faith in the canal as a paying concern. Jonathan Backhouse, though willing himself to subscribe to the measure, believing it would be a great national advantage, declared in August, 1818, that he would be afraid of inducing others to invest their money in it.†

But here was a project for a new canal, inspiring confidence and arousing enthusiasm—a project which had been launched by a man of indomitable energy, and declared practicable by an engineer who had just gained professionally a good deal of credit by completing the Pocklington canal within his estimates.‡

This new canal, which took the shortest route possible from the coal-field to the Tees, could benefit neither Darlington nor Yarm: it might, not improbably, injure the trade of both towns by developing that of Stockton. It was necessary for Darlington and Yarm to do something in self-defence, and the most obvious course was to revive the half-abandoned canal scheme of 1768 and 1813.

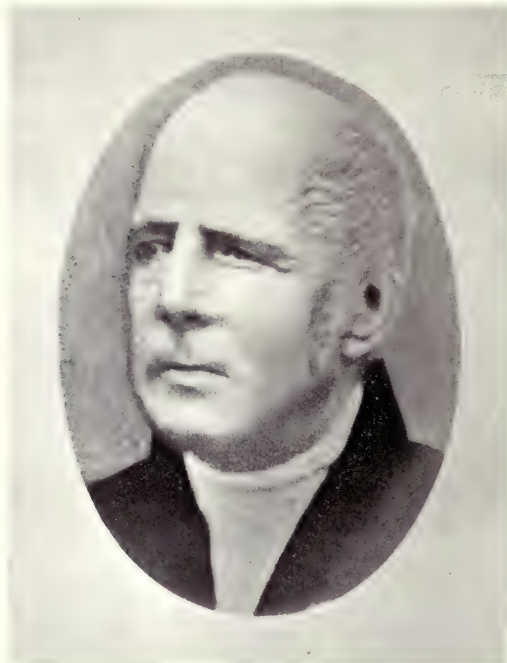
Yarm led the way in organising the opposition to the northern line. Several of the more zealous supporters of the original canal scheme lived in the quaint old Yorkshire town: Thomas Meynell, of the Friarage; Jeremiah Cairns, his steward; Benjamin Flounders, a gentleman of private means; Richard Miles, a timber and slate merchant; and Cuthbert Wigham, a draper. They were in close touch with Leonard Raisbeck (who, at the public meeting in the Stockton Town Hall, had predicted dire consequences to the trade of that town if the canal were carried past it to Portrack), with Jonathan Backhouse, Robert Botcherby, jun., and other men of influence in the district. The most active member of the group was Richard Miles, but the most influential was Jonathan Backhouse. The former had already taken up arms against the new canal scheme and had

* Letter by "X.Y.Z." in *Durham County Advertiser* of 15th August, 1818; also letter from Jonathan Backhouse, jun., to T. Miles, 7th August, 1818. N.E.R. Muniments.

† Letter to T. Miles, 7th August, 1818.

‡ *Hull Advertiser*, 8th August, 1818.

dealt some vigorous blows at it through the columns of the *Newcastle Courant* and the *Durham County Advertiser* of the 8th August: the latter had found the calculations on which the prospective revenue of the new scheme was based so erroneous, that "he could not conceive that the public would be gulled by them,"* and, therefore, did not think it necessary to take any immediate action. But as the filling-up of the Stockton and Auckland



JONATHAN BACKHOUSE.

subscription lists went steadily on, he felt less sure of the wisdom of the public, and suggested that a meeting should be held in Darlington "to consider the propriety of adopting the plans of Brindley and Whitworth and Rennie."† Though himself in favour of a canal from Stockton to Darlington, with a railway thence to the collieries, he realised that nothing would be effected if they did not keep to a definite object, which, in this case, meant pursuing the old line.

With considerable skill he indicated the principal lines of attack: "Our claim to public support will be that the prospect of Stockton becoming a port for the export of coals is hopeless, at least for a century to come; that

our profits, therefore, must arise from landsale; that the old line will embrace *double* the tonnage of coals for home consumption that the new one can possibly do, besides all the merchandise and traffic from a manufacturing district; that the number of locks will be one-third less; and that, even when the export of coals may become practicable, the additional expense of bringing them by Darlington will be so trifling as not to affect it."‡

* Letter to T. Miles, 7th August, 1818. N.E.R. Muniments.

† Letter to L. Raisbeck, 11th August, 1818. *Ibid.*

‡ *Ibid.*

Christopher Tennant and his party had formed an accurate estimate of the capabilities of the Tees, but subsequent events will show that it was no disadvantage to the promoters of the early railway to have doubted the practicability of an export trade in coals.

At this point in our narrative comes in that curious element of chance which plays so mysterious a part in human affairs. Jeremiah Cairns, of Yarm, who was connected by marriage with George Overton, a Welsh engineer, wrote to him on the subject of the proposed canal. Overton replied in a series of letters, pointing out with much cogency the superior advantages of a tramroad, many miles of which he had both used and laid down. These letters were shown to Richard Miles, who at once saw that in the establishment of an iron road was to be found the solution of their difficulties, and to him, more than to anyone else, belongs the merit of bringing the measure forward.* With characteristic energy he communicated his views to the leading members of the canal committee.

Thomas Meynell, he found, had also seen extracts from Overton's letters and come to the same conclusion as himself. "I am most decidedly favourable to the proposal of a railroad," declared the future chairman of the Stockton and Darlington Railway on the 15th of August, 1818, "and shall be very happy to contribute towards obtaining further information, plans or estimates of the expenses necessary for carrying the same into execution. I do not conceive it necessary to state to you here all my reasons for coming to this decision, suffice it to say that I cannot perceive a prospect of a canal through either line of country paying a reasonable interest to the subscribers,

* Had Richard Miles not fallen into financial difficulties previous to the opening of the line, and been obliged to dispose of his shares, it is probable his name would have occupied a prominent place beside those of the other railway pioneers. It was a true claim which he made in a letter to Joseph Pease, jun., dated 17th June, 1830: "The first impulse that was given to the undertaking originated with myself, and I brought about a meeting at Darlington of those gentlemen who afterwards took the most active part." That the founders of the Stockton and Darlington Railway recognised the value of his services and acknowledged the debt which they owed him is apparent from the following letter written by Edward Pease to Charles Lawrence, the chairman of the Liverpool and Manchester Railway: "As a character of observation, Richard Miles' intelligence enabled him early to appreciate the value and importance of Railways, and he was amongst the first in the kingdom who gave them consideration as objects of public utility: his early efforts by publications in the papers, etc., advocating their importance and entering into a thorough detail of the subject, were of great, I may say of national, utility. He was long one of the committee amongst our earlier subscribers." (Quoted in letter to Joseph Pease, jun., in N.E.R. Muniments.) Richard Miles and Cuthbert Wigham acted in 1818 and 1819 as "secretaries to the chairman." In 1833 an illustrated work on railways by Richard Miles was stated (*Durham Advertiser*, 1st Feb., 1833) to be in the press, entitled, *An Inquiry into the National Advantages of Public Railways for the Conveyance of Minerals, Merchandise and Passengers; with Practical Observations on their Construction, General Economy and Management*, and all students of railway history must regret that it was never published.

whereas it appears to me that a railroad affords a flattering prospect of indemnifying the proprietors.”*

A meeting of the principal members of the Yarm and Darlington groups, with Leonard Raisbeck, of Stockton, was held at Darlington on the 17th of August, when the question of the mode of communication was considered in the light of the statements from South Wales. Mr. Meynell was unable to be present, but his views were placed before the meeting by Richard Miles. And thus, after five years of hesitation, the project of a railway or tramroad was brought definitely forward.

About this time there appeared in the field a formidable opponent to the northern canal in the person of “Alexis,”† who issued a circular letter, reprinted in the *Durham County Advertiser* of 22nd August, 1818, subjecting Messrs. Tennant and Leather’s calculations of revenue to a searching criticism. They had assumed the annual vend of the collieries on their line to be 185,000 tons, but as in one case within the writer’s knowledge they had proved themselves inaccurate, stating the annual vend of the Eden Main Greenfield Colliery to be 35,000 tons when, as a matter of fact, it had never exceeded 21,000, it was probable they had done so in others, and he, therefore, reduced the total quantity proportionately to 110,000 tons. Of this it was improbable that more than a third, or 37,000 tons, would be conveyed by water, namely, 20,000 tons to Stockton and the remaining 17,000 tons to the adjacent district on each side of the canal, for it was obvious that Darlington would still continue to cart its supplies from the pits and, of the coals going into Yorkshire by way of the three bridges, none would pass along the canal but those which crossed Stockton Bridge. With regard to the export trade from the Tees, poor indeed seemed the prospects when there was a difference in favour of the Wear of 5s. 3d. per chaldron in the prices at which the best coals could be laid alongside of the ships in the two rivers. Reviewing the various sources of revenue available to the canal, he doubted whether there was just ground for expecting more than 1 per cent. on an expenditure of £300,000 for the first thirty years.

The advocates of the railway were now anxious to have their views promulgated without loss of time, and it was arranged that a meeting should

* Letter to Richard Miles, Railway Collection, Newcastle Public Library.

† John Grimshaw, a member of the Society of Friends, was for many months the strongest intellectual force at the back of the railway movement. He was the proprietor of a patent ropery at Bishop Wearmouth, and the part owner and manager of Fatfield colliery. His statistical ability enabled him to render great service to the railway cause at a critical stage of its history. In 1820 and 1821 he carried out, in conjunction with Benjamin Thompson, some important experiments with reference to railway traction, from which a series of rules were deduced for general guidance at that time of day. (*Benjamin Thompson’s Inventions*, p. 92.)

be held in Darlington on the 4th of September. Messrs. Meynell, Miles and Cairns wished to send for Overton at once to make a survey, but some of the other gentlemen felt a delicacy about employing, in their collective capacity, any other engineer than Rennie. Mr. Meynell would himself have requested Overton to commence the survey, but he was afraid that, coming from him, such a step might be deemed partiality to a connexion of his steward's. He, therefore, desired Richard Miles "to take upon himself the ostensible part of employing Mr. Overton."* Accordingly, Mr. Miles, on the 22nd of August, communicated with the Welsh engineer, and suggested that he should come north as early as possible in order to get a knowledge of the country before the day of the meeting. Overton accepted the invitation and, on the 3rd of September, went over the ground for the first time between Stockton and West Auckland. Thus, not only did the idea of a survey for the railroad originate with Yarm, but it was Yarm that brought down the engineer, raising, too, it may be added, a small subscription to pay the expenses of his journey.†

On the 4th of September, 1818, was held the memorable meeting in Darlington which gave the first real impulse to the railway movement. It did not take place a day too soon; Christopher Tennant had but a fortnight before, on the 20th of August, got resolutions carried in Bishop Auckland in favour of his scheme, and was using every means in his power to obtain subscribers.

While pointing out the objections to the new line of canal—that it ran through a thinly-populated district without manufactures, and was awkwardly situated for obtaining a supply of water, the Gaunless at times being incapable of furnishing a sufficient quantity—the principal speakers at the meeting, the chairman, Dr. John Ralph Fenwick, of Durham, and Jonathan Backhouse, jun., aimed primarily at showing that the same prospects of revenue held out by the promoters of the northern line could be claimed by those of the southern line, which started from a similar point in the coal-field. "If," said Mr. Backhouse, "on the northern line they can ship coals, so can we on the southern line; if they can realise an estimated income of £57,000, ours must also produce the same sum;"‡ and, in addition, they could count on a further income from the supply of

* Letter to Richard Miles, 21st August, 1818. N.E.R. Muniments.

† The subscribers were Thomas Meynell, Benjamin Flounders, Richard Miles, Jeremiah Cairns, Cuthbert Wigham, John Spence, Richard Appleton and Thomas Miles, and the amount raised was £38 3s. 0d.

‡ *Durham County Advertiser*, 12th September, 1818.

Darlington and the North Riding of Yorkshire with coals, and from the conveyance of merchandise, raw materials and manufactured goods which this populous district might either require or supply. Estimating this additional income at £10,000, he continued: "We should now have a sum as income, not on the expenditure of £200,000, but on a capital of £140,000, and according to their way of estimating their income, the sum of £57,000 would actually be increased to £67,000, so that if they can make the northern line pay 25 per cent. ours, by this way of reckoning, must pay 48 per cent. But, mistake me not," exclaimed the orator, "I enjoy no such golden visions. Neither the one nor the other will do it; but if they can do it, we can do it also."* The feeling of the meeting was expressed in a series of resolutions moved by Leonard Raisbeck, of Stockton, whereby the committee were authorised to have a survey made, "as well for a rail or tramroad for the whole distance of the proposed line from Stockton to the collieries, as for a canal from Stockton to Darlington, and a rail or tramroad from Darlington to the collieries," and to give the Parliamentary notices covering both of these projects.

The terms in which the meeting had been convened made it clear that there were differences of opinion among the committee. The subject to be considered was "a canal or *railway* from Stockton-upon-Tees to Winston Bridge or *West Auckland*, with branches," the mode, and even the precise line, of communication being left unsettled. The resolutions also were framed so that they might be acceptable to two sections of subscribers, one of which, headed by Jonathan Backhouse, preferred a canal, at least from Darlington to Stockton. There was to be a short, sharp struggle before the controversy came to an end.

The day following the meeting Jonathan Backhouse submitted the question to Rennie, who replied on the 12th as follows:—"The propriety of using a canal or a railway depends on local circumstances. If the articles to be transported are of a bulky kind, and principally inland, *i.e.*, uphill, a canal is far preferable to a railway, but if minerals and heavy articles are to be exported far exceeding those to be imported or carried uphill, a railway is preferable to a canal. To decide the question you require it should be ascertained what proportion of carriage will be from the interior country downwards, and what proportion will be to the interior country or upwards."†

* *Durham County Advertiser*, 12th September, 1818.

† Letter to Jonathan Backhouse, jun., 12th September, 1818. N.E.R. Muniments.

In a subsequent report, while restating the general principles which should guide the committee in their inquiries and judgment, he found it difficult to arrive at a definite decision, "not having surveyed the country with an express view to a railway," and "being imperfectly acquainted with the relative proportions of the ascending and descending trade."* To the line by Rushyford, which he professed to have examined in 1813 during the course of his survey, he considered there were insuperable objections, and gave his opinion unhesitatingly in favour of that by Darlington, "whether taken as a line for the exportation of coal or as one for a local trade."†

On the 20th of September Overton completed his survey. The best line for a canal, in his opinion, was the same as that laid down by Whitworth and Brindley, from Stockton to Fighting Cocks, but from this point he thought it desirable to leave their line and keep along the north side of the turnpike road up a slack to the banks of the Skerne near Haughton, cross the river between that place and Darlington, and terminate the canal near Northgate Bridge.

The line of rail or tramroad which he recommended began near the river at Stockton, on vacant ground belonging to the Corporation, and ran by way of Coatham Stob Houses, Goosepool, Fighting Cocks, Red Hall, to the neighbourhood of Haughton, and across the Skerne to a point near Northgate Bridge. From Darlington it proceeded up the north side of the Cocker-ton Beck by way of Thornton Hall, Denton and Morton-Tynemouth to Hilton (where it reached its summit level). It then pursued a winding course over the flat ground by Evenwood Bar and Copeland House, and along the right bank of the Gaunless to Cockfield Fell: it crossed the river near Lands Mill and continued past Norwood and Greenfield Collieries to its terminus near Etherley Colliery, its total length being thirty-five miles. Eight branches were suggested, three to communicate with the principal passages over the Tees—Yarm Bridge, Croft Bridge and Piercebridge; and five with various collieries, increasing the length of line by sixteen miles.

This railway or tramroad, it was estimated, would cost £124,000, an amount which was made up as follows:—

* "A Report relative to the opening a communication by a canal or a rail or tram-way from Stockton by Darlington to the collieries." *Durham County Advertiser*, 14th November, 1818.

† *Ibid.*

20 miles of double way... ..	at £2,800 per mile—£56,000
15 miles of single way with sufficient land to admit of its conversion into a double way	at £2,400 per mile—£36,000
16 miles of single way in the eight branches	at £2,000 per mile—£32,000
51 miles	£124,000

Such then was the plan, and such the estimate, for the proposed iron road, which was to inaugurate a revolution in the world's methods of communication.

As early as the 21st of September, 1818, the name "Stockton and Darlington Railway" had been applied to the project,* but it must not be supposed that, by this time, all the members of the committee were in agreement on the subject of the railway, for, at a meeting held on the 25th of September to consider Overton's report, John Grimshaw and Jonathan Backhouse were deputed to accompany the engineer to London in order to submit the results of the survey to Rennie for his consideration.† It was also suggested that the easiest and surest way of obtaining accurate information as to the merits of the respective plans—railways, tramways or *canals*—would be to send a competent, disinterested person on a tour of inquiry to ascertain the facts. For such a mission no one seemed better fitted than John Grimshaw, and he expressed himself willing to undertake it.‡ But the conference with Rennie and the journey of Grimshaw both fell through for want of means.

Divided as they were in opinion, it was yet necessary to comply with the standing orders of the House of Commons and lodge their plans on or before the 30th of September, if they did not wish the Parliamentary notices which had appeared on the 12th to be invalidated.

There was no time for a very minute examination of the proposed line, and when, at the last moment, the plans were lodged with the Clerk

* Letter dated September 21st, 1818, from Richard Jackson, William Richmond and Richard Miles to Jonathan Backhouse (N.E.R. Muniments). "Having met here (Yarm) this day to investigate the bills relative to the *Stockton and Darlington Railway*, we request you will immediately pay the enclosed accounts by forwarding the amounts to the parties respectively, amounting together to £1,186 2s. 6d."

† Letter from John Rennie to John Grimshaw and Jonathan Backhouse, 30th September, 1818. N.E.R. Muniments.

‡ Letter from Jonathan Backhouse to Leonard Raisbeck, 26th September, 1818. N.E.R. Muniments.

of the Peace at Durham, they bore evident signs of hasty preparation, "part in ink, part in blacklead pencil, and on two or three different pieces of paper *pinned* on the large sheet, without "a section in feet and inches" or even the engineer's name to it as a voucher to its correctness"*—a circumstance which the opponents of the measure afterwards turned to account.

While the question which divided the committee was still being fought out, John Grimshaw, the "Alexis" of the *Durham County Advertiser*, came forward as the champion of the iron road, drawing attention to one of its great advantages: that coals could be carried by means of it direct from the pits to the staith without breakage. An illustration to his hand was that of the Nesham Main coals, which formerly sustained so much damage by trans-shipment from the waggon to the lighter and from the lighter to the ship that they brought but a very low price in the export market, whereas since they had been sent down the Newbottle waggonway to the staiths at Bishopwearmouth, they had commanded the highest price of all the Sunderland coals.†

A consideration like this, coupled with the fact adduced by Mr. Overton that the Sirhowey tramroad, twenty-three miles in length, yielded 18 per cent., while the canal, with which it ran parallel, yielded but 8 per cent., could not fail to have an effect on the minds of the waverers, even though the other side were able to point to so conspicuous an example of failure as the Surrey Iron Railway, a line about eighteen miles long, from Croydon to Wandsworth and Merstham, constructed, it may be noted, under the superintendence of George Leather, the engineer of the rival scheme.

On the 10th of October, Grimshaw followed up his first letter by another of even greater value, "on the advantages likely to be derived by the different classes of the community, by having a railway from Stockton to the collieries in the Auckland district, by way of Darlington." In this communication he estimated the cost of the railway establishment at £100,000, the yearly income at £17,250, the working expenses at £2,250, and the dividend at 15 per cent. Landowners, he showed, would benefit by their tenants getting lime and manure conveyed more easily, and at one-fifth of the expense; the owners of mining royalties, by receiving increased tentale

* "X.Y.Z." in *Durham County Advertiser*, 21st November, 1818. The plan from want of time was not, as Leonard Raisbeck informed Richard Miles, 6th November, 1818, "so *dandyish* as might be wished." The least finished portion was that from Stockton to Darlington—the portion which had been the subject of discussion up to the last moment. It is a mere diagram of the course of the line, with a few particulars pencilled in. The sheet of paper on which it is traced has now come *unpinned* from the body of the plan.

† "Alexis," in *Durham County Advertiser*, 3rd October, 1818.

rents* consequent on a larger vend; consumers of coal, by obtaining their fuel at little more than one half of the price they were paying for it. The advantages which would be gained by farmers especially, residing 10 miles from Darlington or Yarm and Stockton, and accustomed to cart their coals through these towns, would be considerable. They might, he pointed out, leave their carts at Darlington, take five empty waggons with their own horses to the collieries, and return with 10 tons of coal, depositing them in some place of safety. They could then lead them home at their convenience, saving, in the one case, one hundred and twenty-eight miles of travelling, or sixteen miles per cart-load, and, in the other two cases, two hundred and sixty-four miles, or thirty-three miles per load.

Meanwhile the promoters of the canal by Rushyford were preparing for the final struggle. They obtained a supplementary report from Mr. Leather, who had made another survey of the country round the head of the proposed line, dealing with some of the objections urged—and with reason—against his plan: they engaged, also, three of the most eminent colliery viewers in the North of England—John Buddle, Thos. Fenwick and Edward Steel—to ascertain the comparative qualities of the coal being worked near the line of the canal, with special reference to their fitness for exportation.

The results of these surveys were laid before the subscribers at a general meeting held at Stockton on the 31st of October. As it appeared from the reports that many of the difficulties which had presented themselves could be successfully overcome; that coals, valued by the three experts at 28s. per chaldron, if delivered free on board in the Tyne or the Wear, could be shipped in the Tees at prices ranging from 25s. 2d. to 26s. 2d.; that the supposition of an export trade of 100,000 tons a year was not an extravagant one, there was a hopeful feeling in the meeting which remained loyal to the idea of a canal, and gave no support to the motion, submitted by Messrs. Flounders and Meynell, that “a number of gentlemen unconnected with either railway or canal should be appointed to judge of the respective merits of those undertakings.”†

Of the sum which it was necessary to raise before an Act of Parliament could be obtained—four-fifths of the total capital—only £88,600 had been subscribed. The rest of the money required, it was hoped, might be got in London, and a committee was formed to further this object.

* Rents payable at so much per ten, a measure which usually consists of either $17\frac{1}{2}$ or $18\frac{1}{2}$ Newcastle chaldrons.

† *Durham County Advertiser*, 7th November, 1818.

A week after the Stockton gathering, the Darlington party gave notice of a general meeting to be held on the 13th of November, 1818. A meeting of no ordinary interest this, for the chief business before it was "to determine whether a canal or railway or tramroad should be adopted."

The committee appointed to consider the question, converted to Mr. Pease's view that it would never answer to break the line of communication and have to shift the load, had already decided* to recommend the adoption of a rail or tramroad throughout the entire line between Stockton and the collieries; their chief grounds for doing so being the great difference in cost between the iron road and a canal, combined with the fact that the country between Darlington and Stockton offered such very favourable gradients for the conveyance of merchandise by rail.

When, on the day appointed, the subscribers came together, with Dr. John Ralph Fenwick again in the chair, they found in the report of the committee a very definite proposal to consider. This was for a rail or tramroad with an estimated net revenue of £15,000 a year, which, on an expenditure of £100,000—the assumed cost of the main line and three of the branches—represented a profit of 15 per cent.

The committee had framed their estimates of revenue on a very moderate basis as compared with those of the canal party: they had reckoned on 80,000 rather than 100,000 tons being sent down the railway for home consumption, and had only allowed 10,000 tons—or one cargo a week—for exportation. Altogether, from the carriage of coals, stone, lime and general merchandise, they calculated upon an annual revenue of £17,478, which, as results afterwards showed, was singularly near the mark. But when they came to estimate what was a quite unknown quantity in 1818—the working expenses and repairs—they got very far wrong, deducting but £2,478, which was scarcely 15 per cent. of the gross receipts.

The principal speakers at the meeting were Jonathan Backhouse, Edward Pease and John Grimshaw, who found it necessary not merely to dilate on the advantages of the railway as a private speculation and a public benefit, but to demonstrate its superiority over a rival scheme which had got several weeks' start of it. Jonathan Backhouse led off with a critical examination of the canal party's estimates of revenue, which, if correct, he argued were equally favourable to the railway. The chief force of his attack was directed against the prices at which, it was stated, coals

* Probably at the committee meeting held on the 23rd of October, 1818.

could be put into the barges on the canal. A proper allowance, he showed, had not been made for the cartage of the coals from the pits, and for the screening out of them of the "duff"—a process requiring to be done before they would realise the value assigned to them by the three mining experts. His object was clear: upon these prices depended the whole question of the Tees being able to compete with the Tyne and the Wear.

If the prices had been understated, away went the "pleasing vision" of an export trade.

A similar line of argument was pursued by John Grimshaw, whose speech was, in a measure, complementary to Mr. Backhouse's; and when, at his request, William Stobart, jun., rose in the meeting to state, as the managing partner of Etherley Colliery, that he could not afford to put coals into the barges under 15s. 9d. a chaldron, which was 3s. 3d. higher than the price given in the report of the Auckland Canal Committee, a strong case against the canal scheme was brought to an effective climax.

If, then, the chief profits of the canal were to come from a trade that was pro-



EDWARD PEASE.

blematical, what were the prospects of the railway or tramroad? It fell to the lot of Edward Pease, who claimed to have formed his opinion on "unerring data," to demonstrate that the railway was a perfectly safe speculation; and he did so in a characteristically shrewd and practical way. This was his argument: the traffic from which the railway would derive its income already existed, and, from a limited portion of it, there was assured to the railway a *certain* return of 5 per cent. on a capital of £120,000. His data were the tolls from the coal-road between Darlington and West Auckland, which were let, he understood, for about £2,000 a year. The

average charge for a single cart-load (something less than a ton) was 6d., which might be taken as equivalent to a halfpenny a ton per mile. Now, he said, if a halfpenny per ton per mile produce from the turnpike gates an annual rent of £2,000 for the short distance of twelve miles, then three halfpence per ton per mile, the sum proposed to be charged for rail dues for the same distance, will produce an income of £6,000, or 5 per cent. on the estimated capital. An objection, he foresaw, might be urged against the proposal to charge three halfpence for dues, when the coals were conveyed in the ordinary way for a halfpenny: he explained, therefore, that, although a heavier charge was levied, there would be a great saving in labour and carriage. By the railway, ten or twelve tons, probably more, would be drawn by one horse, whereas, to obtain the same quantity by road, a cart would have to make ten or twelve trips, which, for such a distance, would occupy almost as many days. The whole of the coals vended at the pits, he pointed out, did not pass along the coal-road. A large quantity went by other routes to avoid the tolls, and would probably come upon the railway. Except for a passing, but suggestive, reference like this to encouraging possibilities of revenue, he stuck to the one fact which he was anxious to drive home, the certainty of an adequate return. "I am satisfied," he said, "with 5 per cent. Some can make it out to be 6 or 8 or 10 or 12 per cent.—I do not know how much: there is ample room for calculation—but I am quite satisfied with my 5 per cent.; and I have only made this statement to show that, by one single article, we can make a sufficient rate of interest by this undertaking, and all the rest may be taken as profit over and above 5 per cent."*

This mode of advocacy was an unusual one, and as an able writer has justly observed, "Jonathan Backhouse made the cleverer speech, but Edward Pease, by his dogged refusal to see anything but his 5 per cent. and his simple demonstration that his 5 per cent. was secure, did more to convince people that the railway was a 'safe' speculation than the most brilliant oration that could have been delivered in its support."† The meeting adopted the recommendation of the committee, and decided to apply to Parliament for "an Act to make a tramway on the plan and estimates given by Mr. Overton." It also authorised surveys to be made for an extension of the rail or tramway into the North Riding of Yorkshire, in the direction of Richmond, of Northallerton and of Guisbrough.

* *Durham County Advertiser*, 21st November, 1818. A "corrected account" of Mr. Pease's speech was inserted in this paper the following week, but while fuller, perhaps, in its details, it appears to be rather a literary version than a verbatim report of the real utterance.

† W. T. Stead in an article on the Railway Jubilee, *Northern Echo*, 22nd September, 1875.

Immediately after the meeting the Darlington committee issued their prospectus,* entitled "Proposals for making a public railway from the collieries near Auckland to Darlington, Yarm, and Stockton, for the supply of the south and east parts of the county of Durham and the North Riding of Yorkshire with coals, and for the general conveyance of merchandise." It was signed by William Chaytor, jun., the chairman of the committee, and was drawn up on the lines of Grimshaw's letter of the 10th of October, the same advantages being specified. The estimates, however, differed slightly from Grimshaw's and even from those of the committee's own report of 13th November, the probable cost of the railway being set down as £113,600 and the probable receipts as £16,500.

Within a week £25,000 had been subscribed, and the good opinion of the tramroad was stated to be increasing daily.†

As to the canal by Rushyford, speakers and writers had handled the scheme so roughly that there was little vitality left in it, and after George Overton had shown, in a timely letter to the *Durham County Advertiser*, how in South Wales the profits of the canals were diminishing with the progress of the tramroads,‡ even the advocates of the northern line began "supposing a railway by Rushyford instead of a canal"§; and when, on the 15th of December, the supporters of the canal came together at Stockton to hear officially that the deputation to London had failed in obtaining subscriptions, it appeared to them desirable to ascertain whether a railroad on the northern line should not be substituted for a canal, and a committee was appointed to inquire into the subject. Some of them probably had in their hands a copy of a pamphlet only just issued by the Darlington Railway committee, entitled "Observations on the proposed railway or tramroad from Stockton to the collieries by way of Darlington,"|| in which the various grounds for preferring the railway to a canal were succinctly enumerated. To these considerations they could scarcely be indifferent, and when the chairman (Colonel Sleigh) begged leave to anticipate the report of the engineer by transferring his canal subscription to the project of a railway, he interpreted the feeling of many of the gentlemen present, who, following his example, subscribed between £20,000 and £30,000 before they left the room.¶

* "I drew the first prospectus when I was nineteen years of age," said Joseph Pease on the 16th of June, 1854, when giving evidence on a Stockton and Darlington Railway Bill before a Select Committee of the House of Lords.

† Letter from Richard Miles to George Overton, 20th November, 1818. N.E.R. Muniments.

‡ *Durham County Advertiser*, 21st November, 1818. § *Ibid.*, 12th December, 1818.

|| Reprinted in the *Durham County Advertiser* of 19th December, 1818.

¶ Letter by "T.J." in *Durham County Advertiser* of 19th December, 1818.

In the resolutions and proceedings of this meeting we have the genesis of the unfortunate Clarence Railway, which now forms an important part of the North Eastern Railway system.

Distrust of Darlington was largely at the bottom of this proposal for another railway to the coal-field. The line by Darlington had been drawn in such a way as to promote primarily the interests of that town, and Stockton chafed at the thought of having to pay dues on its coals for thirty miles when there were working collieries within fourteen miles of its doors. The Darlington party, alarmed at the growth of this hostile feeling, passed on the 19th of December a resolution, which was afterwards printed and circulated, declaring that their project had no *separate interest*, but "was obviously calculated to extend the general prosperity of the eastern and southern districts of the county of Durham and the North Riding of the county of York," and inviting the inhabitants of Stockton to unite with them in furthering it by taking up some of the few remaining shares.*

In vain, however, did they hold out the olive branch. On the 24th of December the committee of the rival scheme addressed a circular letter to their subscribers, stating that after carefully weighing all the information they possessed, and availing themselves as far as they could of the calculations of the Darlington committee, they had no hesitation in deciding that the interests of the town of Stockton and of the whole country adjacent to the northern line demanded that a railroad should be constructed to enter the coal-field at the nearest possible point.†

The very day that John Cartwright, the chairman, signed this circular letter, it was stated that the Darlington subscription lists were all filled up.‡ Two days later—as applications were still coming in—the committee resolved that no further subscriptions be received.§

Yet, despite this gratifying evidence of public support, there was a shadow over the councils of the Darlington party. Mr. Mewburn, one of the solicitors, on examining Mr. Overton's plan, found that his line passed over part of Lord Eldon's estate at Eldon, and, what was even worse, through one of Lord Darlington's fox-covers. He told Mr. Overton the bill would never pass with two such powerful opponents, but there had not been time to make any alterations.|| It was, therefore, in no very sanguine mood that they were going forward to Parliament.

There are indications, too, that some of the Darlington committee had

* N.E.R. Muniments.

† *Durham County Advertiser*, 26th December, 1818.

‡ Letter from Richard Miles to Matthew Plummer, 24th December, 1818. N.E.R. Muniments.

§ Railway Collection, Newcastle Public Library.

|| *Larchfield Diary*, p. 176.

not much confidence in Mr. Overton. They wanted his plan confirmed by engineers of established reputation. It had already been proposed to consult Rennie again. As he had previously reported in favour of a canal between Stockton and Darlington, the committee probably felt that they could not be guided entirely by his opinion, and they looked about for another engineer to act in conjunction with him.

Mr. Mewburn having mentioned the subject in a letter to the Hon. William Maule (afterwards Lord Panmure),* that gentleman recommended Robert Stevenson, the engineer of the Bell Rock Lighthouse, who was the great authority on railways in Scotland. He had just completed the Newton or Edmonston Railway (from Newton Colliery to the Edinburgh and Dalkeith road, near Little France); his plans for a railway from Brechin to the harbour of Montrose had been adopted at a meeting in Brechin on the 10th of November; and he was seeing through the press the well-known pamphlet on the Edinburgh Railway which contains so eulogistic a reference to George Stephenson (see p. 29).

On the 19th of December it was decided to ask Messrs. Rennie and Stevenson to meet Mr. Overton, and examine his survey. Mr. Stevenson at once accepted the invitation, but Rennie stood on his dignity, replying that he had been accustomed to think for himself in respect to the numerous public works on which he had been engaged, many of them of infinitely greater magnitude and importance than the Darlington Railway, and as the committee would not be satisfied with his opinion unless joined to that of another, he declined to entertain the proposal.†

The Committee had now to ascertain the best type of iron road. The choice lay between the practice of South Wales and that of the North of England. On other public railways, such as the Surrey Iron Railway in England and the Kilmarnock and Troon Railway in Scotland, the example of Wales had been followed, and for the obvious reason that carts and other vehicles besides waggons were intended to make use of them. It was computed that there were at this time about 300 miles of tramroad in the Principality,‡ and about 225 miles of railway, both wooden and iron, in the counties of Durham and Northumberland,§ so that the experience of the two districts was fairly equal. Adapted as the tramroad was to general traffic,

* Speech of Francis Mewburn at Darlington, 27th February, 1857.

† Letter from John Rennie to Jonathan Backhouse, 26th December, 1818; and to Raisbeck and Mewburn, 2nd January, 1819.

‡ Letter from Jos. T. Price to Edward Pease, 22nd December, 1818.

§ *Annales des Mines*, 1818, vol. iii., p. 130.

there were serious objections to it, one being the friction of the wheels against the upright ledge or flange of the plates, and another its liability to become obstructed with dirt and small stones. Better results had also been obtained on the railway than on the tramroad. Upon one well-made tramroad in Wales four middle-sized draught-horses were accustomed to draw regularly twenty-four tons eight miles and bring back the empty waggons the same distance : * on another, a single horse continued for some time to haul ten tons and bring back the empty trams, travelling regularly a distance of nineteen miles per day, † whereas, on the Killingworth and Newbottle colliery railways, ‡ one horse drew six waggons weighing twenty-three tons and brought back the same number of empty ones weighing seven tons : on the Team colliery railway one horse drew four loaded waggons weighing fifteen tons and brought back four empty ones weighing five tons. §

So far the committee had shown a preference for the tramroad, and had even ascertained the terms on which the plate-rails could be conveyed from South Wales to Stockton. But now from South Wales itself there came a word of counsel, and that was, not to decide the question without further investigation. It was admitted that the opinion of nine-tenths of the intelligent men in Wales would be in favour of the tramroad, and yet, in the face of that opinion, a railway was being laid down within four miles of Neath Abbey by an engineer who had been led to adopt this plan by "seeing the improved railroads in use in the North where steam-engines are employed as the moving power." ||

Another question, which had formed the subject of a resolution at the November meeting, was whether the line could be shortened by the aid of machinery or other means. It was to obtain information on this point, as well as on the comparative merits of rail and tramways, that Mr. Overton, summoned from Llanthetty to meet Mr. Stevenson, visited, on the 18th of January, 1819, the Pelaw Main and Fawdon waggonways, ¶ the latter of which had just been brought into operation by Mr. Benjamin Thompson. **

* Letter from Jos. T. Price to Edward Pease, 22nd December, 1818.

† George Overton, *A description of the faults or dykes of the Mineral Basin of South Wales*, 1825, p. 44.

‡ Nicholas Wood, *Treatise on Railroads*, 1825, p. 231, and "Alexis, jun.," *Durham County Advertiser*, 21st November, 1818

§ Nicholas Wood, *Treatise on Railroads*, 1825, p. 234.

|| Letter from Jos. T. Price to Edward Pease, 22nd December, 1818. Railway Collection, Newcastle Public Library.

¶ *Benjamin Thompson's Journal*, vol. ii.

** The construction of this waggonway (from Fawdon to Scotswood), Mr. Josias Jessop considered "highly creditable to the skill and ingenuity of the contriver," being "much better laid and maintained in a more perfect state" than any other he had seen. *Report on the most desirable mode of improving the communication between Newcastle and Carlisle*, 1825.

By the end of the month Mr. Stevenson had completed what he called "a perambulatory survey," and had expressed a favourable opinion of the undertaking. In the light of subsequent events it is interesting to note that from Darlington he proceeded to Killingworth, already a place of renown in connection with the problems of railway traction. Here, on the 29th of January, in the presence of George Stephenson, Nicholas Wood, and Benjamin Thompson, he made some experiments on the draught of horses with coal waggons,* and there can be little doubt the project of the Stockton and Darlington Railway would be discussed in all its bearings.

The time was now approaching when the first bill of the Stockton and Darlington Railway was to be brought before Parliament, and on the 5th of February, 1819, Messrs. Mewburn and Overton had arrived in London to look after the interests of the bill in its early stages. That it would encounter great opposition was only too apparent, and the members of the committee set themselves resolutely to the task of bringing pressure to bear on prominent representatives of both Houses, enlisting the services of men of influence—like John Grey, the eminent land agent, who, though not connected with the measure, were favourable to it. All the landed gentry in the neighbourhood of the railway, with the exception of Thomas Meynell, Benjamin Flounders, William Chaytor, jun., and Thomas Allan, were opposed to the scheme. Of these the most redoubtable were Lords Eldon and Darlington. Lord Eldon went carefully over the bill—it was this bill which Earl Grey observed him correcting, owing to pressure of work, whilst on his knees at prayers in the House of Lords†—and he made in the margin of his copy several queries and observations, from which, says Mr. Mewburn, "it is obvious that this must have been the first railway bill he had read through, for his Lordship's ignorance of the standing orders of his own house is greatly amusing."‡ Lord Eldon's criticisms are chiefly directed against the clauses providing for the compulsory purchase of land. "Why," he asked, "are lands to be conveyed at all? If the use of the surface is wanted for railways or buildings as wharves, etc., why is the soil to be conveyed? Why not a wayleave and a license to use the surface? Coals are the principal article that suggests this scheme, but if the soil of the railway, etc., is conveyed, then, if a seam of coal runs under that part of the soil, the former owner of the land must stop his workings. Is that meant? Or the Company may make him pay what *they* please for working under the railway."§

* *Benjamin Thompson's Journal*, vol. ii.

† *Larchfield Diary*, p. 175.

‡ Marginal note in Mr. Mewburn's copy of the first Act.

§ Transcript of Lord Eldon's remarks in Mr. Mewburn's copy of the first Act.



Stage Wagon.

One clause had been drafted with the object of enabling the owners and occupiers of lands "adjoining the railway to lay down branches to it." This limitation of the privilege Lord Eldon considered unfair to those whose lands were near, but did not actually adjoin, the proposed line. "Unless this clause is made more extensive," he adds, "it's plain the Act is a coal-owner's job, aided by subscription."* In consequence of this objection, it may be stated incidentally, the words "within five miles" were afterwards substituted.

Lord Darlington's antagonism to the scheme sprang from a totally different cause. He probably resented as much as Lord Eldon any innovation on the wayleave principle of the North of England, but perhaps if the railway had not been carried through one of his fox-covers his opposition might not have taken a very active form. As it was, being a great sportsman, he could not condone such an offence, and refused all the concessions which were offered to him, declaring that the measure appeared to him "harsh and oppressive, and injurious to the interests of the country through which it is intended that the railway shall pass."†

Turnpike road trustees and the proprietors of coaches, waggons, vans and other vehicles were of course antagonistic to the measure. Some of the farmers were unfriendly to it because they thought their fields would be cut up in such a way as to render the farms scarcely cultivable; it was gravely alleged that their cattle, hay and corn would be stolen by the waggoners employed on the railway.‡

With the object of removing some of the opposition, the subscribers, at a general meeting held at Darlington on the 12th of February, empowered the committee, if they thought it expedient, to drop the Piercebridge and Croft branches. The solicitors, according to a notice dated the 24th February, 1819, were authorised to purchase the securities of the creditors and mortgagees of the tolls arising from the turnpike road leading from Darlington to West Auckland at the price originally given for them.§ Later on in the month, a deputation was appointed to attend the progress of the bill in London. It consisted of the Archdeacon of Cleveland (the Venerable Chas. B. Hamilton), Captain Chaytor (the chairman), Thomas Meynell, Benjamin Flounders, John Backhouse, jun., and Edward Pease, who immediately on their arrival in the capital began a systematic

* Transcript of Lord Eldon's remarks in Mr. Mewburn's copy of the first Act.

† *Jubilee Memorial of the Railway System*, p. 29.

‡ *Larchfield Diary*, p. 8.

§ *The Diaries of Edward Pease*, 1907, p. 85.

canvassing of members. They went out for this purpose in couples and "it used to give Sir William Chaytor much pleasure in after life narrating how Mr. Flounders actually refused to go out in company with him; he, although a pleasant, genial country-gentleman, of considerable influence with the landed proprietors of the two counties, being by no means particular as to dress; and his seedy, old beaver hat, considerably the worse for wear, being too much for Mr. Flounders, who, despite his Quaker collar, was a little bit of a dandy."*

It was no perfunctory task they had undertaken—that of breaking down prejudice and removing misconception, and it required great assiduity, combined with considerable tact and judgment. Mr. Mewburn especially seems to have felt the burden. "The difficulties, pains, and anguish which I endured during my sojourn in London while soliciting the bill," he wrote, "can scarcely be conceived."†

The promoters of the bill had been allowed by the House to deposit, on or before the 12th of March, the section of the line which, as they stated, in consequence of the illness of one of the surveyors, they had omitted to lodge at the proper time. But they could not alter the original plan, and as the time drew near for the second reading of the bill, petitioners against it drew attention to the defects of the plan, which did not enable an owner or occupier of land to ascertain what part of his property was intended to be taken, and pointed out errors in the book of reference, the names of several persons having been improperly entered as assenting to the measure.

Many promises of support, however, were received and the opponents of the bill became alarmed. The solicitors of the Earl of Darlington sent a letter informing him that the Quakers were much stronger than had been anticipated, and entreating him instantly to post to town. When the letter, which was marked "immediate," arrived at Newton House, his Lordship was following the hounds. A servant was therefore despatched with it cross country. He found his master in full chase with "a beautiful scent."

On receiving the letter his Lordship read it with great vexation, called off the hounds, and all the way home abused the Quakers, whom he never forgave, in the forcible language of the day. He then swallowed an early dinner and posted up to town, where he arrived on the morning

* *Northern Echo*, 23rd September, 1875.

† *Larchfield Diary*, p. 8.

of the day appointed for the second reading of the bill (5th April). At four o'clock he was seen in the lobby canvassing members.* Fifteen petitions in favour of the bill from the towns and villages of the North Riding of Yorkshire were presented almost at the last moment, but they availed nothing. The adverse influences at work were too powerful and, when the House divided, the bill was lost by a majority of thirteen, 93 having voted in favour of it and 106 against. The result was far from discouraging to the friends of the railway: it showed them their strength and secured the respect of their opponents. "If the Quakers," remarked a certain nobleman, "in these times when nobody knows anything about railways can raise up such a phalanx as they have done on this occasion, I should recommend the country-gentleman to be very wary how they oppose them."† In the report which was read at a general meeting held on the 11th of May the committee ascribed the loss of the bill to the very short space of time allowed for completing the surveys, for making friendly arrangements with the land-owners and others, and to the extremely imperfect delineation of the plans arising from the same cause.‡ The feeling which pervaded this meeting, the first after the defeat, was not one of dismay, but of cheerfulness and encouragement to persevere.§

By this time the committee were in possession of Mr. Stevenson's report, which was not altogether favourable to Overton's line. In recommending, however, very considerable alterations, "indeed new lines from Darlington to the coal-field,"|| Mr. Stevenson appears to have exceeded his instructions, which were merely to view Overton's line and give his opinion upon it. While the committee were considering the possibility of a change of route which should avoid Lord Darlington's grounds altogether, they received a proposition from Mr. Overton, offering, with the assistance of David Davies, to make a new survey for a line of railroad from the Auckland coal-field by Darlington to Stockton, with a branch to Yarm, and to prepare the requisite plans and books of reference for £120, it being understood that if, through any defect in the plan, an application to Parliament should fail, the above sum was to be repaid.¶

This proposition was accepted on the 9th of July and shortly afterwards,

* *Larchfield Diary*, pp. 176-177.

† Speech of Francis Mewburn at Darlington, 27th February, 1857.

‡ Railway Collection, Newcastle Public Library.

§ *Durham County Advertiser*, 15th May, 1819.

|| Letter from R. Stevenson to W. Chaytor, jun. *Northern Echo*, 23rd September, 1875.

¶ Minutes of committee meeting, 9th July, 1819. N.E.R. Muniments.

on the 30th, overtures were made to the committee from the promoters of the Northern Railway, which had taken the place of the Auckland canal, for a union of the two measures. This railway was intended to run from Stockton to Cockfield, with a branch from Bradbury to Tudhoe, and the promoters were willing, if the Darlington party would join hands with them, to throw out two branches for the accommodation of Yarm and Darlington—one from Redmarshall (6 m.) and the other from Rushyford (9 m.). This proposition was declined on the ground that the northern line did not hold out such general and extensive advantages as the line by Darlington.* So the two parties went their own way and gave in their respective parliamentary notices, the one, for a railway or tramroad from the north-east corner of Cockfield Fell to the river Tees at or near Portrack and Billingham Reach, with branches to Stockton and Tudhoe; the other, for a railway or tramroad from the Tees at Stockton to Railey Fell, with branches to Yarm, Cockfield Fell, Witton Park, Darlington (Northgate Bridge) and Coundon Grange.

When the plans were lodged, the line by Darlington was shown running north, passing through the Middridge Grange estate by means of a tunnel near School Aycliffe instead of going through Denton. It was with considerable reluctance that George Overton altered the course of his line,† foregoing the advantages which he anticipated from a communication with North Yorkshire. He succeeded, however, in shortening the line by nine miles.

On the 9th of December a conference took place between the rival parties, when the respective merits of the two lines were carefully investigated, with the result that an arrangement was made by which the Northern Railway scheme should be abandoned in favour of the Southern one. It was agreed that, in case the subscribers to the railroad from Stockton by Rushyford, and termed the Northern Railroad, should relinquish the prosecution of that undertaking, the maximum tolls to be charged for the passage of coal on the projected railroad by Darlington should be limited to the following sums, viz., 2d. per ton per mile upon coal for home consumption and $\frac{1}{2}$ d. per ton per mile upon coal for exportation, over and above the charge of 6d. per ton for passing the descending and ascending inclined planes intended to be constructed on the latter railroad.‡

* Minutes of committee meeting, 30th July, 1819. N.E.R. Muniments.

† Letters from George Overton to Francis Mewburn, 16th and 19th November, 1819.

‡ Minutes of committee meeting held at Stockton, 19th December, 1819.

Thus, when Parliament opened in 1820, the promoters of the Stockton and Darlington Railway found themselves alone in the field. They had overcome the objections of Lord Eldon by agreeing to pay liberally for his land, and, by the deviation of the line, had removed the opposition of Lord Darlington. Bright, therefore, were the prospects of their bill when, on the 29th of January, 1820, an important event happened—the death of George III.—which interfered with all private legislation, and the Parliamentary agents, finding that there was no chance of the bill passing before the dissolution, and considerable uncertainty as to its doing so in the new Parliament, advised the committee to defer proceeding until the session of 1820-21. This recommendation was adopted on the 12th of February,* and the measure was accordingly suspended for another year.

The delay was not altogether a disadvantage to the railway interests. The plan, which the newspapers of August, 1820, announced had been left to the “scientific management” of Colonel Chaytor and Mr. Meynell,† was still incomplete, and negotiations were proceeding with prominent landowners. In diverting their line the projectors had escaped from Lord Darlington, but had fallen into the hands of Lord Barrington. Whichever way they went there was a noble lord to be propitiated.

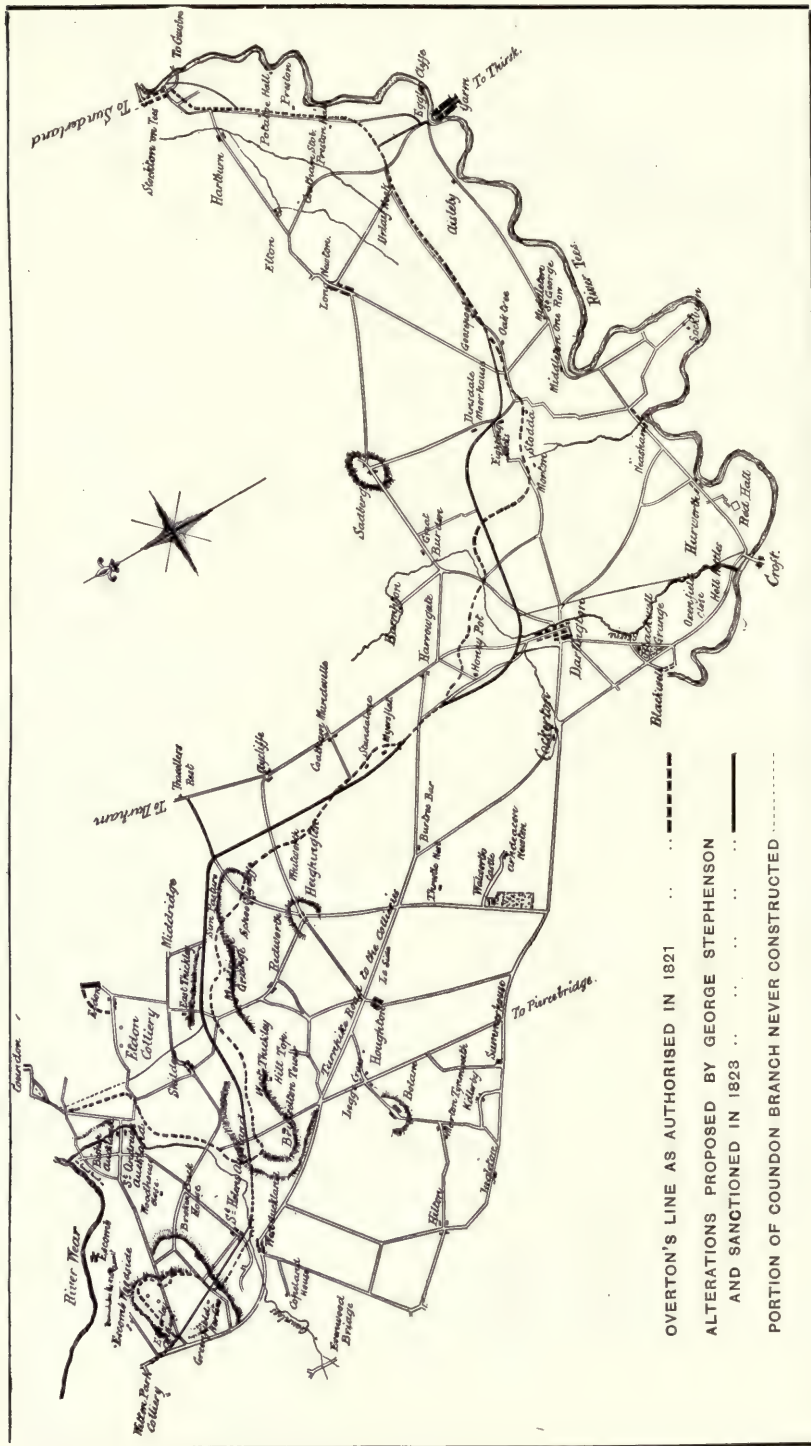
Mr. Overton was again asked to vary the course of his line, but could make no alteration which would be satisfactory to both parties, and, on the 2nd of September—only four weeks before the plans were acquired to be lodged—went so far as to suggest a complete change of route. “As there is so much difficulty,” he wrote to Mr. Mewburn, “in regard to Lord Barrington and others on the line above Darlington, I am inclined to think the road may be taken nearly the whole of the way to the village beyond Denton by the side of the present cart or turnpike road, and by coming upon a higher level from Etherley to Cockfield and over the summit by Evenwood. A descending inclined plane will communicate the upper and lower parts. Mr. Cairns considers this plan objectionable because it leaves out Black Boy, Eldon, etc.; on the other hand it embraces Piercebridge, and the road will be shorter. The ascending inclined plane will be avoided as well as a deal of expensive work.”‡

The suggestion, probably for the reasons hinted at in the letter, was not entertained and the line finally adopted was that by Middridge Grange,

* Minutes of committee meeting held at Yarm. N.E.R. Muniments.

† *Durham County Advertiser*, 12th August, 1820. *Durham Chronicle*, 19th August, 1820.

‡ Letters from George Overton to Francis Mewburn, 3rd July and 2nd September, 1820.



PLAN OF STOCKTON AND DARLINGTON RAILWAY
 (Showing Overton's Line and George Stephenson's Alterations).

the Parliamentary notices appearing on the 16th of September. Mr. Overton thus summarised the variations from the plan of 1820:—

“The branch from the top of the descending inclined plane is by the present survey extended from its termination last year, near the bottom of Cockfield Fell, to Hagger Leases Lane, near the junction of several roads, which will furnish an opportunity of sending the lead and other produce of the adjacent country down to the port of Stockton.

“The branch to Coundon Grange is also extended to a field near Coundon turnpike-gate, which will afford means to Mr. Wharton of sending his coal to market over the railway, as well as to deliver goods nearer to Bishop Auckland than the line of last year.

“The main line is also extended over the whole of the wharves at Stockton, to give an equal opportunity to all the wharfingers of sending goods back over the road, or of receiving lead, corn, etc., brought down the said road.

“No other material alteration has been made from the survey of last year.”*

The railway for which plans were lodged in the office of the Clerk of the Peace on September 30th, 1820, comprised the following lines:—

	Miles	Fur.	Ch.
Main Line	26	6	9
Yarm Branch	0	6	3
Darlington Branch	0	7	0
Coundon Branch	3	4	0
Hagger Leases Lane Branch ...	4	6	0
Short branch at south end of Stockton	0	0	7
	36	6	9

In November, 1820, the Darlington committee, with an eye to subscribers, issued a “further report on the intended railway or tramroad from Stockton by Darlington to the collieries with a branch to Yarm,” illustrated by a small map showing the course of the line. They quoted a recently published opinion of Baron Dupin, that to the iron railway England owed much of her wealth, and after enumerating the public advantages of the proposed line, and reiterating their conviction that

* Report to the Committee, 29th September, 1820; reprinted in *Jubilee Memorial of the Railway System*, p. 33.

there was a reasonable prospect of the subscribers receiving 15 per cent. for their money, they alluded to the favourable change of public opinion in regard to their project, as shown by the few dissenting voices heard when leave was asked to cross private property.

The *Durham Chronicle*, Mr. Lambton's new Liberal organ, cast its influence on the side of the railway, and an article which appeared in its columns on the 25th of November drew attention to many of the benefits of the new mode of conveyance.

Early in 1821 the promoters of the railway issued their second prospectus—a very brief one—which was accompanied by a tinted plan of the line, engraved by Thomas Bewick & Son. The public were invited to consider the following, amongst other, points in favour of the project:—“The line passes through a populous district in which an extensive trade already exists (thus *maintaining Trade and Capital in their wonted channel*, without detriment to old establishments).” “The carriage [of coal, etc.,] will be reduced nearly *one-half* the present charge, and that over a district containing not less than 40,000 inhabitants.” “A great nuisance will be removed from the roads in this part of the country, by substituting for the numerous one-horse carts and carrying horses and asses, which now infest them, about one-tenth of their number on the railway.”*

When the bill came before Parliament the promoters were faced with little opposition. They had come to terms with Lord Barrington (whose name appeared in the bill as one of the first proprietors), appeased Lord Darlington, pacified the Misses Hale by an offer to purchase Coxhoe and Quarrington Collieries† which, it was contended, would be placed by the projected railway in a state of inferiority as compared with other collieries, allayed the fears of turnpike road commissioners and, in fact, conciliated nearly everybody. Yet, strange to say, the bill nearly came to grief on the ground of non-compliance with the standing orders of the House which required that four-fifths of the amount of the share-capital should be subscribed before the bill went into committee. Mr. Mewburn found that he was £7,000 short. He had been to Norwich to the banking house of Gurney & Co., and through all the City, having obtained introductions to the Stock Exchange, and to several merchants, but still he remained so much short. He wrote to Mr. Pease to tell him he must return home unless he received subscriptions for the sum named within three or four

* Reprint in the *Northern Echo*, 26th January, 1877.

† Minutes of committee meeting at Darlington, 20th February, 1821.

days. Not a farthing could now be got in Darlington or the neighbourhood, and Mr. Pease subscribed the whole £7,000 himself.* The transaction is thus recorded in the minutes of a meeting held at Yarm on the 21st of March, 1821:—"In order to complete the sum necessary to pass the House of Lords, it has been proposed by Edward Pease to add £7,000 to his *bonâ-fide* subscription of £3,000 and that the said £7,000 shall be considered as lent upon mortgage on the intended railway or be taken as shares as the said Edward Pease may determine."

Whatever exception may have been taken before this date to the Quaker ascendancy on the board of management—the cause of the resignation by Colonel Chaytor of his position as chairman of the committee—there could have been none afterwards. Edward Pease, by his prompt and resolute action in a critical emergency, practically saved the situation, and gained a right to that preponderating influence which he subsequently enjoyed. From this time forward he was the virtual head of the Stockton and Darlington Railway. The danger was averted: the bill was read a third time on the 12th of April, agreed to by the Lords on the 17th and received the Royal Assent on the 19th. The smooth and successful passage of the bill through Parliament in the session of 1821 was largely due to a misconception—to the mistaken view which was fortunately held by the promoters that the railway would not carry coals for exportation. This view had the effect of removing the opposition of those who were interested in the coal-trade of the Tyne and the Wear. Mr. Lambton, who had done so much to further the progress of the bill, afterwards declared to John Allan, of Blackwell, that "if he had thought any export would ever have taken place by the Darlington Railway they should never have had an Act."† The twenty-first Railway Act passed by Parliament since the beginning of the century, it was largely modelled on the Berwick and Kelso Act of 1811 by Mr. Mewburn, who repeated in it a considerable number of the provisions of the earlier Act.

The Act was a comparatively long one, consisting of sixty-seven pages. It contemplated merely the conveyance of coal, iron, lime, corn and other commodities downwards, and of general merchandise, etc., upwards, passengers being evidently unthought of. The line was intended to be open to the public, like a highway, on payment of the following tolls:—

* Speech of Francis Mewburn at Darlington, 27th February, 1857. *Darlington and Stockton Times*, 28th February, 1857. The memory of the speaker must have been at fault when he stated that the sum required and subscribed was £10,000.

† Letter from Christopher Tennant to Richard Otley, 8th September, 1826. N.E.R. Muniments.

	Per ton per mile.
For limestone, road-metal and manure	4d.
For coal, coke, culm, cinders, stone, marl, sand, lime, clay, ironstone, building stone, pitching and paving stone, bricks, tiles, slates and all gross and unmanufactured articles and building materials	4d.
For lead in pigs or sheets, bar iron, waggon tire, timber staves and deals and all other goods, commodities, wares and merchandise	6d.
For all coal which shall be shipped on board of any vessel or vessels in the port of Stockton-upon- Tees for the purpose of exportation	$\frac{1}{2}$ d.

Over and above these tolls a shilling a ton was allowed to be charged on all articles passing the inclined planes upon the railway or tramroad (pp. 42 and 43). It was stipulated that the waggons and other carriages used were to be constructed agreeably to the orders and regulations of the Company (p. 54), and that the owner of every waggon or carriage should have his name and address with the number of the vehicle, painted in large white capital letters and figures on a black ground three inches high at least, and of proportionate breadth, on some conspicuous part of the outside (p. 48). The use of the railway was to be limited to certain hours of the day, viz., from 7 in the morning to 6 in the evening during the months of November, December, January and February; from 6 in the morning to 8 in the evening during the months of March, April, September and October; and from 5 in the morning to 10 in the evening during the months of May, June, July and August (p. 53). Every driver opening a gate set up across the railway was required to shut and fasten it again under a penalty of 40 shillings, one half of this sum to go to the informer and the residue to the poor of the township or parish in which the offence might have been committed (p. 53). The owners of land within five miles of the line might make branches and form junctions (p. 55), and they were also at liberty to construct wharves or sidings near the railway and load and unload goods upon them (p. 55). The time allowed for the completion of the railway was five years (p. 59). Powers were granted by this Act to raise £82,000 in shares and £20,000 by loan.

CHAPTER III.

FORMATION AND OPENING OF THE STOCKTON AND DARLINGTON RAILWAY.
[1821-1825.]

The same day* on which the royal assent was given to the first Stockton and Darlington Railway Act, a memorable interview took place at Darlington in a plain but substantial-looking brick house in Northgate, nearly opposite to the Bulmer stone, between two remarkable men—Edward Pease and George Stephenson.

There is ground for stating that Mr. Pease had little confidence in Overton as a civil engineer. His own judgment had not ratified the opinion of his friend, Mr. J. T. Price, of the Neath Abbey Iron Works, that Overton was “a man of spirit and enterprise, very competent to project and lay out a road.”† He had found, as he afterwards stated in 1832, that Overton “was not the man they wanted.”‡ After increasing so greatly his stake in the railway, he looked round for an engineer to report on the Parliamentary line, having grave doubts whether it was the best that could be laid down. The first name to occur to him would almost certainly be that of George Stephenson, already recognised as an authority on matters connected with railways, and attracting attention by his improvements in rails and locomotive engines (see p. 29). Some account may have reached Mr. Pease of the ingenious combination of gravity and steam power which he had devised for Mr. Brandling on the Coxlodge waggonway—first tried on the 5th of October, 1818—and he would probably be aware that a line of railway, the survey for which had been made by George Stephenson, was at that time in course of formation through a difficult tract of country between Hetton Colliery and Bishopwearmouth, a distance of over seven miles.§ To George

* The authority for this date is Nicholas Wood, *Address on the two late Eminent Engineers*, 1860, p. 24.

† Letter from J. T. Price to Edward Pease, 22nd December, 1818. Railway Collection, Newcastle Public Library.

‡ That he was “wholly incompetent,” as asserted by Mr. Mewburn in a marginal note to his own copy of the “Observations on the Proposed Railway or Tramroad,” 1818, is a statement which cannot be accepted without question.

§ It has hitherto been stated that Stephenson began the construction of the Hetton railway in 1819. But the sinking of the colliery was not commenced until 19th December, 1820, and tenders for the “cuts and batteries” on the line of the railway were not advertised for until 17th March, 1821.

Stephenson Mr. Pease decided to apply. A special messenger—John Dixon—was sent to Killingworth with instructions to tell the engineer what was going on at Darlington, and to say that if he would come over Mr. Pease would be glad to see him.* That the interview took place *by appointment* is distinctly stated by Nicholas Wood, who accompanied Stephenson on this occasion.†

The two friends rode from Killingworth to Newcastle on horseback, travelled by coach to Stockton, then walked along the proposed line of railway to Darlington, a distance of twelve miles, and called upon Mr. Pease late in the afternoon.

Stephenson's "honest, sensible look" and unpretending manner made a favourable impression on Mr. Pease, and a letter which he brought from Mr. Richard Lambert, the principal agent of the "Grand Allies," showed in what high estimation he was held by his employers. An animated conversation took place on the subject of the railway, and Stephenson did not fail to advocate the use of the locomotive engine, with the powers of which he was so thoroughly conversant. This was a new factor in the railway problem which had not been taken into account. The Stockton and Darlington Railway Act merely provided for the hauling or drawing of waggons and other carriages upon the line "with men or horses or otherwise" (p. 4). The chairman of the committee of the Northern Railway had recklessly hinted that ten miles of the line, which were perfectly level, might be worked for almost nothing by locomotive‡ engines, but no such suggestion had been thrown out in connection with the line by Darlington. At this time there was not such a great difference between the performances of locomotive engines and horses as to turn the scale in favour of the former mode of traction. The best locomotive engine had never hauled much more than a certain strong horse had done on the Surrey tramroad on the 24th of July, 1805, when, as the result of a wager, it dragged, with apparent ease, twelve waggons weighing 38 tons 4 cwts. 2 qrs. a distance of six miles in one hour and forty-one minutes, bringing back sixteen waggons weighing 55 tons 6 cwts. 2 qrs.§

Leaving Mr. Pease to reflect on the views which had been placed before

* *History of the Darlington and Barnard Castle Railway*, 1877, p. 12. The statement is given on the authority of John Dixon himself.

† *Address on the two late Eminent Engineers*, 1860, p. 24.

‡ Memorandum of conference between John Cartwright and the committee of the Stockton and Darlington Railway, held at Yarm, 30th July, 1819. N.E.R. Muniments.

§ *Annual Register*, 1805, "Chronicle," p. 408.

him, George Stephenson and his companion turned their steps homeward. The last coach having gone, they were obliged to walk to Durham, a distance of eighteen miles, finding perhaps some compensation for weary limbs in the thought of the great improvement in the mode of travelling which, it was evident from that day's interview, would shortly be brought about.

On the 12th of May, 1821, the shareholders of the newly-sanctioned railway held their first meeting, after the passing of the Act, at the King's Head Inn, Darlington, and elected a committee or board of directors, which consisted of:—

John Backhouse,
Jonathan Backhouse,
Richard Blanshard,
Robert Chaloner,
William Chaytor,
Benjamin Flounders,
Rev. William A. Fountaine,

Thomas Meynell,
Rev. Daniel M. Peacock,
Edward Pease,
Joseph Pease, jun.,
Richard W. C. Peirse,
William Skinner,
William Skinner, jun.

Thomas Meynell resumed his position as chairman, and Jonathan Backhouse was re-appointed treasurer.

The committee at once set to work to collect information as to the comparative advantages of railways and tramroads. On the 25th of May they adopted a design for a corporate seal—a horse drawing four waggons, and a motto, suggested by the Rev. Daniel Mitford Peacock of Great Stainton, *Periculum privatum utilitas publica* (at private risk for public service); authorised the taking of two rooms in the High Row for offices;* and directed Mr. Meynell and Mr. Pease, with a view to the construction of the railway, to ascertain the charges of engineers for undertakings of this kind.

Mr. Pease communicated with George Stephenson, who stated his terms on the 13th of June. As the outcome of a correspondence between Mr. Meynell and Robert Stevenson, of Edinburgh, the latter gentleman had an interview on the 6th of July with Messrs. Pease and Backhouse “on the



* These rooms were taken from James Marshall, cabinetmaker, No. 9, High Row.

subject of the railway and the business of an engineer”* and, on the 13th, embodied his views in a report for the guidance of the board.

By the 23rd of July, the directors were in a position to arrive at two important decisions. They adopted the railway in preference to the tram-road, and agreed to employ George Stephenson to make a fresh survey of Overton's line. To both of these decisions they were probably helped by a remarkable letter (already quoted, pp. 16 and 30) from William James to some member of the committee other than Edward Pease. This railway pioneer, who, in the capacity of engineer of the Stratford and Moreton Railway, had visited most of the railroads in the kingdom, described the edge-rail as “infinitely preferable” to the plate-rail, and eulogised, in no measured terms, the North-country engineers,† ranking Stephenson next to Watt in point of mechanical ability.

William James had probably been one of the number of “scientific gentlemen” who had attended at Killingworth Colliery two months before—on the 28th of May—to witness some experiments with a new locomotive engine designed by the “ingenious Mr. George Stephenson,” as the *Newcastle Chronicle* styled him. “To the astonishment of all present,” it is recorded, “the engine conveyed with the utmost facility, upon a railway having an elevation of one eighth of an inch to a yard (1 in 288) twenty laden coal waggons, the correct weight of which, with the engine itself, may be estimated at nearly 100 tons, with an amazing degree of rapidity and with an effect upon the whole which beggars description.”‡

This was the locomotive engine which the designer, a month later, informed Robert Stevenson, of Edinburgh, had “far surpassed his expectations.”§

With the press proclaiming “the extraordinary talents” of the Killingworth enginewright, and eminent engineers acknowledging his great merits, the Darlington directors could have little hesitation in giving the survey into his hands.

* Robert Stevenson's account. N.E.R. Muniments.

† “Altho' my letter is to you and Mr. Pees (*sic*) and his friends of a private nature, I feel it due to the characters and talents of the Northumbrians to declare that, in the sciences of mining and mechanics, we can, in the south, in no respect be compared with them, and with such great and noble-minded men as Mr. Blackett and Mr. Buddle, and such abilities as Mr. Stephenson's and Mr. Chapman's, I cannot conceive my observations deserving of any other notice than to shew how sensible I am of the value of these gentlemen, and of the esteem in which I hold the plans and characters of yourself and your friends in Durham.” 22nd June, 1821.

‡ *Newcastle Chronicle*, 2nd June, 1821.

§ Letter from George Stephenson to Robert Stevenson, 28th June, 1821. *Life of Robert Stevenson*, 1878, p. 129.

On the 28th of July Mr. Pease transmitted a copy of the resolutions to Stephenson, with a request that he would take them into his consideration and let him know what his charge would be for the survey. "In making thy survey," he added, "it must be borne in mind that this is for a great public way, and to remain as long as any coal in the district remains. Its construction must be solid, and as little machinery introduced as possible—in fact, we wish thee to proceed in all thy levels, estimates, and calculations with that care and economy which would influence thee if the whole of the work was thy own."*

The object of the survey, according to the instructions given, was to ascertain whether the Parliamentary line was practicable throughout, and whether any improvement could be made to it by a deviation within the authorised limits. It was foreseen that the engineer might think it desirable in some parts to overstep these limits: in that case he was to give particulars of the grounds which would be affected, and to make a comparative estimate of the cost of both the deviated and the authorised line, to enable the directors to decide whether the difference in cost would defray the expenses of a new Act. He was also to ascertain whether the tunnel and deep cutting contemplated in Lord Barrington's property could be avoided without entering into Lord Darlington's land, and whether either or both of the inclined planes could be superseded by a tunnel within the authorised limits.†

Stephenson replied on the 2nd of August, agreeing to make the survey, which he calculated would occupy him five weeks, and to furnish the requisite estimates and reports, etc., for the sum of £140, allowing him, as he expressed it, "to be moderately paid."‡

Before, however, any arrangement could be made with the engineer there came, on the 7th of August, a letter of remonstrance and counsel from Mr. Meynell, calling in question the policy of spending more money on preliminary surveys and estimates, and disapproving of any deviation beyond the authorised limits which would involve another application to Parliament. The sub-committee, before whom the communication was brought on the 22nd of September, explained in reply that notwithstanding the heavy charges made by Mr. Overton, he had supplied them with no

* Letter published in the *Sunderland Herald* of 15th March, 1857, reproduced in *Artizan* of 1st April, 1857, and since in various works.

† Minutes of general meeting, 23rd July, 1821.

‡ Letter from George Stephenson to Edward Pease, published in *Sunderland Herald* of 15th March, 1857, and since in various works.

sufficient report or specifications to enable them to enter into contracts for the execution of the railway, or justify them in purchasing the land through which it was intended to pass, and that more minute and detailed information than he had supplied appeared to be indispensable before the work could be properly entered upon. They had, therefore, felt it their duty to employ another engineer. "In fixing upon Mr. Stephenson they had been influenced solely by the high character they had received of him from various quarters as an intelligent, active, experienced and practical man, assiduous in his attention to what he undertook, and moderate in his charges." As to the question of deviation, for their own satisfaction as well as for the satisfaction of Mr. Meynell and the subscribers generally, the sub-committee would not fail to restrict Mr. Stephenson's survey and estimate to the line sanctioned by the Act; and expressly inform him that no other line must be thought of or explored without absolute necessity.*

Summoned to Darlington by letter bearing date the 22nd of September, George Stephenson attended a meeting of the sub-committee on the 27th, when his proposition with regard to the survey was accepted, and John Dixon, a young man possessing an intimate knowledge of the district, grandson of that George Dixon of Cockfield who had taken a prominent part in the promotion of the canal scheme of 1768, was engaged to accompany the engineer and assist him by pointing out the course of Overton's line† and affording local information.

It was not, however, until the 15th of October that Stephenson received instructions to proceed with the survey. Robert Stephenson, just eighteen, assisted his father with the levelling, and thus gained his first experience in railway engineering.

Meanwhile, a question of some importance was engaging the attention of the committee. The prices of iron being at their lowest, it was considered a favourable time to enter into contracts for the supply of rails, but the directors had not yet decided what kind to lay down. The choice lay between malleable and cast-iron rails, and, with insufficient data before them, they found it difficult to come to a conclusion. George Stephenson, who was firmly convinced of the superiority of the malleable iron rails, and had predicted that they would in a short time do away with the cast-iron railways,‡ advised the directors to adopt them. As he was known to have

* Draft of letter to Mr. Meynell. Railway Collection, Newcastle Public Library.

† Sub-committee minutes, 27th September, 1821.

‡ Letter from George Stephenson to Robert Stevenson, 28th June, 1821. *Life of Robert Stevenson*, 1878, p. 129.

a joint interest in the best cast-iron rail then in use, his recommendation naturally carried much weight. Such candour and impartiality, however, were not appreciated by his co-patentee, William Losh, of the Walker Iron Works, who wrote a most ungenerous letter to Mr. Pease, attributing unworthy motives to Stephenson and disparaging the Bedlington rail.* But the statements made to the detriment of their engineer—denied by Mr. Longridge as soon as he heard of them†—could carry little weight with the shrewd men at the head of the Darlington Railway, who had already formed their own estimate of Stephenson's character.

Though the insinuations contained in this letter were properly disregarded, Mr. Losh's strictures on the Bedlington rail, with the instances given of its supposed failure and the observations reputed to have been made in disparagement of it by colliery agents and other practical men, even by the great mining authority, John Buddle himself, could not be so readily put aside. Besides, the cast-iron rail was much the cheaper of the two.

The owners of Hetton Colliery, it may be noted, had the same question to consider at the very same time, and decided in favour of the cast-iron rail, against the advice of both George Stephenson, of Killingworth, and Robert Stevenson, of Edinburgh. It is not surprising, therefore, that some of the shareholders came to similar conclusions and that, in deference to their opinion, a certain quantity of cast-iron as well as malleable iron rails were advertised for.‡ The sub-committee recommended that two-thirds of the line should be laid with malleable iron and the remaining portion with cast iron, but the board on the 29th passed a resolution that the whole of the line should be laid with malleable iron—a resolution which, as will be seen later on, was not strictly carried out.

Before the end of the year Stephenson had completed his survey and

* Letter from William Losh to Edward Pease, 3rd November, 1821 (Railway Collection, Newcastle Public Library). The insinuations contained in this letter were that Stephenson recommended the Bedlington rail because Mr. Longridge was the best customer that he had for his Willowbridge coals; that Mr. Longridge dealt with a foundry in which he (Stephenson) was interested, for his chairs and other metal work; and paid him a premium for procuring orders. "In the very long intercourse I have had with the world," he added, "I have found most people lean to their own interest, and I certainly do not think G. Stephenson an exception to the general rule. I do not state this as an objection to his general character, which I esteem very much, but these engagements in business being strictly contrary to the rules of his employers . . . to whom he owes his success in life, and his opposition to those who have most materially assisted him are at least a proof that interest has more influence over his mind than gratitude."

† Letter from Michael Longridge to Edward Pease, 14th November, 1821. Railway Collection, Newcastle Public Library.

‡ "With respect to the Stockton and Darlington Railway Company advertising for *cast-iron rails*, it was merely to please a few of the subscribers who have been brought over by some of the *cast-iron founders*, but they have only advertised for one-third to be cast-iron." George Stephenson to William James, postmarked 20th December, 1821. *The Two James's and the Two Stephensons*, 1861, p. 48.

made his estimates and plans. He was able to report that a practicable line might be obtained within the limits granted by the Act of Parliament, but that there were serious objections to it on account of the deep cuttings or tunnels which would be required, and the numerous curves in its course.

He, therefore, suggested another line, which, while rendering necessary the use of machinery, was laid down on the principle that "the nearer railways approach to a straight line the better."* The chief alterations proposed were: (1) between Etherley Lane and Norlees Lane, the line being carried over the hill instead of round it, and the distance shortened by a mile and a half; (2) between Redworth Lane and Whiley Hill, the line running a little to the north of Overton's, and avoiding some excavations and embankments at Redworth Lane, the Hawthorn and Middridge Grange, together with the tunnel at School Aycliffe; (3) between Little Whessoe Back Lane and the Oak Tree Farm, the line passing nearly a mile nearer to Darlington, and, from the North Road, pursuing almost a straight course for three miles, in marked contrast with the sinuous course of the other. A deviation was made from the Parliamentary line a short way out of Stockton, in order to bring the railway nearer to the bridge over the Tees, and extend it along the quay to the various wharves. The Coundon branch, instead of diverging from the main line at the west side of Brusselton Hill, left it two miles further east, near to East Thickleigh. The Evenwood branch was taken from Evenwood Lane along the left bank of the Gaunless to St. Helens Auckland, instead of along the higher ground to Norlees.†

The advantages of Stephenson's line were obvious—a shortening of the distance from the collieries to Darlington by nearly three miles, and a general improvement of the gradients, by which a gradual and continuous descent was obtained towards Stockton. A horse, it was calculated, would haul ten tons on the new line with more ease than seven tons and a half on the old one, for, in addition to the retarding effect of the curves, there was, in one section, a rise of 1 in 470 in about two miles, up which the loaded waggons would have to be drawn.

In making his survey, there is no doubt Stephenson had kept in view the probability of steam-power as well as horse-power being employed on the railway. "We fully expect," he wrote to William James in December, 1821, "to get the engines introduced on the Darlington Railway,"‡ and there is reason to believe that at this early date Mr. Pease was already favourable to the new mode of traction.

* George Stephenson's report, dated 18th January, 1822. N.E.R. Muniments. † *Ibid.*

‡ Letter from George Stephenson to William James, postmarked 20th December, 1821.

With the completion of the survey another stage was reached in the progress of the railway. The master-mind had appeared to direct and control its future development. The provisional services of George Overton were no longer required. He had kept himself disengaged, it seems, expecting daily to be sent for to re-survey the line, which he "looked to as a matter of course,"* but he had failed to inspire confidence, and the summons never came. On the 24th

of December he was asked, presumably as a matter of courtesy, to attend a meeting for the consideration of the proposed alterations to his line, and was informed that the plans and sections would be ready for the inspection of himself and his friends, but this proposition he curtly declined and, protesting that he "had not been superseded in a handsome manner at all,"† dropped immediately into the background, and his name is not met with again in our railway annals. The advocate of tramroads and horses in preference to railways and steam engines, he had failed to perceive that the

new power which had first been exhibited on a tramroad completed by himself‡—the tramroad from the Pen-y-darran Ironworks to the Navigation House on the Glamorganshire Canal—was the tractive power of the future, and his published opinion that "an engine on a *public* railroad would be a perpetual nuisance"§ stamped him as an engineer without much prescience.



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GEORGE STEPHENSON.

* Letter from George Overton to Francis Mewburn, 5th January, 1822. Railway Collection, Newcastle Public Library.

† *Ibid.*

‡ *A description of the faults or dykes of the Mineral Basin of South Wales*, 1825, p. 44.

§ *Ibid.*, p. 51.

On the 22nd of January, 1822, the shareholders of the Stockton and Darlington Railway Company met "for the purpose of electing the Engineer" and transacting other important business. At this meeting, which was held in the Company's office in the High Row at Darlington, George Stephenson was definitely appointed at a yearly salary of £660, out of which he "was to provide for the services of assistants." He was directed to proceed at once with the construction of the unaltered parts of the old line, and the committee received authority to apply to Parliament for its sanction to the proposed deviations and alterations.

The sub-committee, who had already entered into contracts with the Bedlington Iron Company for the supply of 1,200 tons of malleable iron rails at £12 10s. per ton, and with the Neath Abbey Iron Company for the supply of 306 tons of cast-iron rails at £6 15s. per ton and 304 tons of cast-iron chairs at £6 9s. per ton, now pushed matters vigorously forward.

By the 8th of February Stephenson had staked out a portion of the main line between Stockton and Oak Tree, together with the Yarm branch. Soon afterwards he journeyed to London to purchase oak blocks, and to South Wales to inspect the casting of the rails and chairs ordered from the Neath Abbey Iron Works. He then concluded an arrangement with some quarrymen at Brusselton, by which they were to supply stone blocks for the western portion of the line at fivepence each, an allowance being made to them for opening out the quarry. Tenders for the "cuts and batteries," which had to be sent in not later than the 6th of May, were considered and accepted, and on Monday, the 13th of May, 1822, the actual work of constructing the railway was begun.* Ten days later—on Thursday, the 23rd of May—the formal inauguration of the railway took place in connection with the laying of the first rails.†

There was much rejoicing at Stockton on this occasion, which was recognised as a memorable one in the history of the town. The ceremonial proceedings, for which the ringing of church bells, and the festal display of bunting on municipal and private buildings and on the ships in the harbour, had since early morning prepared the inhabitants, commenced about three o'clock in the afternoon with the arrival of the chairman, Thomas Meynell, of Yarm, who was accompanied by his neighbour and colleague on the board, Benjamin Flounders, and two Roman Catholic priests, the Rev. Thomas Storey, of Stockton, and the Rev. John Bradley, of Yarm. The chairman's carriage, preceded by his popular Yarm band, was drawn into the town by

* *Durham Chronicle*, 18th May, 1822.

† *Durham County Advertiser*, 24th May, 1822.

a number of workmen. At the Town Hall a procession was formed, and Mr. Meynell, attended by the Mayor, Corporation, and leading citizens of Stockton, together with a number of navvies—between two and three hundred of them—carrying spades and axes, etc., marched down the High Street and along the New Walk to St. John's Well, which was the place appointed for the ceremony.*

Mr. Meynell took his stand near the small brick house adjoining the line, not far from the window that looks towards the crossing, the Mayor and Recorder and other local dignitaries facing him,† and, without any preliminary observations, laid several rails of the new road—malleable iron bars, fifteen feet long and twenty-eight pounds in weight, the first to be used by a public railway company. A royal salute was fired and the band struck up “God save the King,” as he fixed them in position.

More was accomplished this day than could be foreseen. Not only was there laid near St. John's Well the first of an illimitable series of rails which in a few years were to connect the most distant parts of the earth, and produce incalculable social changes, but Mr. Meynell, in placing these first rails 4 feet 8 inches apart,‡ practically determined the standard gauge of Great Britain, a gauge that has enabled the principal railways of the world and their rolling stock to be constructed and maintained at a minimum cost, while admitting of the remarkable developments in speed and carrying capacity which have been witnessed in the last few years.

For the Stockton and Darlington Railway, as for the Hetton Colliery Railway, George Stephenson had adopted the gauge of the Killingworth

* *Durham County Advertiser*, 24th May, 1822.

† Note in one of the late James Clephan's scrapbooks in reference to woodcut in *Illustrated London News* of 2nd October, 1875.

‡ In spite of the definite statement of Nicholas Wood (*Treatise on Railroads*, 1838, p. 138) that the original gauge of the Stockton and Darlington Railway was 4 feet 8½ inches, there is abundant evidence to show that it was 4 feet 8 inches. The deputation from Liverpool in 1824 found “the width of the railroad, inside, 4 feet 8 inches”; Joseph Pease, on the 28th of June, 1839, stated before a Parliamentary Committee that the width between the rails was 4 feet 8 inches, adding “they are *practically* 4 feet 8½ inches”; and John Dixon, the engineer of the company, in a note on the Whitehaven Junction Railway in 1846, confirms this statement:—“and I (John Dixon) can testify to the fact of there being half an inch difference in the gauge of the Great North of England Railway and the Stockton and Darlington Railway, and that engines and carriages reciprocally travel on each line daily without danger or a suspicion thereof from that cause: indeed, the fact of this difference is not generally known.” Further evidence to the same effect is adduced in the *Proc. Inst. Mechan. Engineers*, 1875, p. 84, and 1877, pp. 158-162. The outside width of the rails must have been at first 5 feet 0½ inch and, when rails with a breadth at the top of 2½ inches were used, 5 feet 1 inch—the maximum width allowed by the Act of 1825 for the Middlesbrough branch.

waggonway,* the earliest portion of which—from Willington Square to Willington Quay—was laid in 1762. To this date, at least, must the 4 feet 8 inches gauge be referred, for it is extremely improbable that, when a branch was formed from Killingworth Colliery in 1806 to the old waggonway of the “Grand Allies” from Long Benton Colliery (which was still working near Benton Square), the gauge was in any way altered, especially as the Willington coals also at this time went down the line to the river in waggons having the same width between the wheels.

The theory which derives the standard gauge from the circumstance of Mr. William Jessop transferring, in 1789, the flanges from the outside to the inside of his waggon wheels, on a railroad with an exterior width of five feet,† is a purely fanciful one, without the slightest historical basis.

Was this standard gauge, as stated by Lord Armstrong,‡ “fortuitously determined by the distance between the wheels of the cart for which wooden rails were originally laid down?” There is no evidence that this was the case. The width between the rails on the old horse railways and tramroads was generally four feet. This was the common gauge, according to the writer of the article “Coalery” in the second edition of the *Encyclopædia Britannica* (Edinburgh) which was published in 1778. It was the gauge of the South Moor and Tanfield waggonway as given in 1765;§ of the Surrey Iron|| and the Kilmarnock and Troon¶ Railways, the one opened in 1805, the other in 1812; most of the Welsh tramroads, of which the great Sirhowey tramroad** was a typical example, were laid to a gauge of 4 feet 2 inches.†† The variations are too great to admit of this theory covering them all. While the gauge of the Middleton waggonway (1758) was 4 feet,‡‡

* Wood, *Treatise on Railroads*, 1838, p. 138.

† “The fact that Mr. Jessop first decided to have an outside gauge of 5 feet, and then changed to an inside gauge without altering the width of the rails, is, of course, the reason why we to-day have a gauge of 4 feet 8½ inches. In other words it is 5 feet less the width of two of Mr. Jessop’s rails.” Clement Stretton, *History of the Loughborough and Nanpantan Edge-Railway*, 1893.

‡ Inaugural address to British Association, 1863.

§ M. Jars (*Voyages Métallurgiques*, vol. i., p. 200), who is careful to explain that this distance at which the rails were placed from each other formed “la largeur intérieure du chemin.”

|| Whishaw’s *Analysis of Railways*, 1837, p. 288.

¶ *Transactions of Highland Society of Scotland*, 1824, vol. vi., p. 9.

** T. G. Cumming, *Origin and Progress of Rail and Tram Roads and Steam Carriages*, 1824, p. 26.

†† Letter from J. T. Price to Edward Pease, 22nd December, 1818. Railway Collection, Newcastle Public Library.

‡‡ Plate No. 42 in Strickland’s *Reports on Canals, Railways, Roads, and other Subjects*, 1826.

that of the Wylam waggonway (formed previous to 1763) was 5 feet.* The gauge of the Beamish waggonway (1763) and of the Shield Row waggonway which joined it was 4 feet 4 inches.† An approximation to the standard gauge is found in the width of the Kenton and Coxlodge waggonway—4 feet 7½ inches‡—which joined the older Bigges Main waggonway. From the data obtainable the 4 feet 8 inches gauge seems to have been peculiar to the waggonway which connected Killingworth Moor with the Tyne.

Since the commencement of the works on the 13th of May, such rapid progress had been made by the contractors, then known as “undertakers,” that by the 31st of May, the ground, which was extremely favourable, requiring little labour in earthwork, was, for about two miles, ready for the laying of the rails.§ By the autumn six out of the seven miles of the parliamentary line between Stockton and Darlington, which it was not proposed to alter, together with the Yarm branch, three-quarters of a mile in length, had been practically completed, and preparations made for beginning the works at the western end of the line.

On the 18th of November, 1822, the Hetton Colliery Railway, which had been formed under the direction of George Stephenson, was brought into use, the traffic being worked over five self-acting inclines and conveyed over other portions of the line by locomotive and stationary engines. The directors of the Stockton and Darlington Railway had thus an opportunity of seeing in another part of the country a successful application of the principles which had guided George Stephenson in the laying out of their own line.

These principles, deduced from a series of experiments which he had made in conjunction with Nicholas Wood, were, as stated by the latter:— (1) On the level or nearly level gradients, horses or locomotive engines were proposed to be used, a rule being laid down that, if practicable, the gradients ascending with the load should not be more than 1 in 300; (2) in

* O. D. Hedley (*Who invented the Locomotive Engine?* 1858, p. 33). This, according to Mr. J. B. Simpson, was the gauge of the cast-iron railway which replaced, in 1830, the cast-iron plate-way of 1808, altered about the year 1868 to the standard gauge by the Throckley Coal Company. Francis Trevithick, in his life of Richard Trevithick, gives the gauge between the wood rails, on which the Gateshead-built engine was to run, as 4 feet 10 inches (vol. i., p. 185). This would be conclusive if the plans of the engine now in South Kensington Museum were drawn perfectly to scale. The writer says, however, that the wheels of the Gateshead engine were 9 inches further apart than those of the Welsh one. Now, adding 9 inches to 4 feet 3 inches, the width of the Welsh tramroad and the two rail flanges [4 feet 2 inches + 1 inch], we have 5 feet, the breadth of the ancient wooden railway according to Mr. O. D. Hedley.

† Wm. Harrison to Thos. E. Harrison, 2nd August, 1832.

‡ Document, dated 16th May, 1813, in the *Watson Collection*, Mining Institute, Newcastle.

§ Letter from George Stephenson to the committee, 31st May, 1822. *Jean's Jubilee Memorial of the Railway System*, p. 47.

gradients descending with the load, when more than 1 in 30, the use of self-acting planes; and (3) in ascending gradients with the load, where the gradients did not admit of the use of horses or locomotive engines, then fixed engines with ropes.*

The efficient working of the Hetton Railway proved the correctness of Stephenson's conclusions, and was no doubt a factor in reconciling the Stockton and Darlington directors to the use of machinery on their own line.

The time was approaching when they would have to apply to Parliament for its sanction to the proposed deviations, and to an additional branch which it was intended to make from Hill House to Croft Bridge, and it was a question whether they should also take powers to employ locomotive engines on the line. A formidable rival to this mode of traction—the reciprocating system of fixed engines on level and other planes (see p. 18)—had come into operation the preceding year, and given rise to a fierce controversy in the pages of the *Newcastle Magazine* from April to October, 1822, between Benjamin Thompson, the patentee, and Nicholas Wood, the friend and champion of George Stephenson. The disparagement of the locomotive system by an engineer of Mr. Thompson's reputation and his contemptuous reference to the "miserable results of its application on the Killingworth waggonway"† were far from reassuring. It was undeniable that loaded waggons could be hauled by the reciprocating system at a speed of from five to ten miles an hour, which was much above the performance of the locomotive engines of that day, at a cost of from 0'22d.‡ to 0'34d.§ per ton per mile, and the directors might easily have come to the same conclusions as Messrs. Walker and Rastrick, seven years later. Fortunately they had confidence in their engineer and, at his recommendation, included in their bill not only a clause empowering them "to erect and set up a permanent or fixed engine or other proper machine in such convenient situation at or near each of the inclined planes,"|| but a clause—the first of the kind ever submitted to the legislature—providing for the conveyance of passengers by steam-power. It ran as follows:—"That it shall and may be lawful to and for the said company of proprietors or any person or persons authorized or permitted by them, from and after the passing of this Act, to make and erect such and so many loco-motive or moveable engines, as the said company of proprietors shall from time to time think proper and expedient, and to use and employ the same in or upon the said

* *Address on the two late Eminent Engineers*, 1860, p. 23. † *Newcastle Magazine*, 1822, p. 546.

‡ *Ibid.*, p. 263. § *Ibid.*, p. 313. || Stockton and Darlington Railway Act, 1823, p. 6.

railways or tramroads or any of them, by the said recited Act and this Act, directed or authorised to be made, for the purpose of facilitating the transport, conveyance and carriage of goods, merchandize and other articles and things upon and along the same roads, and for the conveyance of passengers upon and along the same roads.”*

An amusing anecdote is told by Mr. Mewburn respecting this clause. When it was submitted to Lord Shaftesbury’s secretary “he could not comprehend what it meant; he thought it was some strange, unheard of animal, and he struck the clause out of this Act.” Mr. Mewburn “sent Mr. Brandling, the M.P. for Northumberland, and George Stephenson to explain the matter to him. Mr. Brandling very soon enlightened his understanding.”†

The hour of the locomotive engine had arrived, and far-seeing men recognised the fact. Even before this famous clause had passed into law, William James had published the first of an intended series of twelve essays on the engine railroad system—never, unfortunately, completed—in which he proposed giving engravings and specifications of the improved locomotive steam-engines, “particularly of that most valuable invention of the author’s greatly esteemed and scientific friend, Mr. George Stephenson, of Newcastle-upon-Tyne.”‡

Conscious of the unreasonable prejudices which existed against the new motive power, the deputation appointed to attend the progress of the bill—Thomas Meynell, Jonathan Backhouse, Francis Mewburn and Leonard Raisbeck—must have had many fears regarding the fate of their measure as they journeyed up to London in February, 1823. George Stephenson accompanied them, and for eight weeks was kept in London, gaining his first experience of parliamentary procedure. Though opposed again by vested interests, the passage of the bill was not a particularly stormy one. It was read a third time on the 5th of May, agreed to by the Lords on the 12th, and received the royal assent on the 23rd of May. Under the powers of this amended Act the directors were enabled to make the various alterations and deviations recommended by their engineer; to construct an additional branch to Croft Bridge; to reduce their capital from £82,000 to £74,300, the estimated cost of the straightened line and the branches (the new one

* Stockton and Darlington Railway Act, 1823, p. 6.

† *Larchfield Diary*, vol. i., p. 13. Not included in the published volume of extracts.

‡ “Report or essay, to illustrate the advantages of direct inland communication through Kent, Surrey, Sussex and Hants, to connect the metropolis with the ports of Shoreham (Brighton), Rochester (Chatham), and Portsmouth by a line of Engine Rail-Road, etc., 1823.” Preface, dated May, 1823.

included); to use locomotive and fixed engines; to charge an extra shilling per ton for goods passing not only *one* inclined plane, but any other which might be formed as authorised; and also to levy a maximum toll of sixpence per mile on every "coach, chariot, chaise, car, gig, landau, waggon, cart, or other carriage using the railway for the conveyance of passengers or parcels."*

Among the petitioners against this bill had been the Earl of Strathmore's trustees, their object being to secure the insertion of clauses compelling the Company, already empowered to do so, to lay down the Evenwood branch, that the coals from their Norwood Colliery might be brought on to the main line. It had been found expedient, on the 22nd of March, to accept the conditions on which the trustees would withdraw their opposition, viz., that the laying of the authorised branch should be suspended until the close of the ensuing session, and that the Company should apply to Parliament during the session for power to vary the branch, taking it from St. Helen's Auckland to Evenwood Bridge, instead of from Norlees House to Evenwood Lane, the trustees agreeing on their part to contribute £300 towards the expenses of obtaining the Act.†

An agreement to this effect was signed on the 22nd of April, and confirmed by a deed of covenant which was executed on the 21st of July.‡

On the 18th of August the Rev. William Luke Prattman, of Barnard Castle, suggested that for the accommodation of his collieries of Butterknowle and Copley Bent, the branch should be carried two miles further to Hagger Leases Lane, a more suitable termination than Evenwood Bridge, as there were roads running thence to Hamsterley on the north, to Middleton-in-Teesdale and the lead-mining district around it on the west, to Staindrop, Barnard Castle, and Brough on the south and south-west.§ The suggestion was adopted, and the usual Parliamentary notice of the Company's intention to apply for powers to relinquish the Evenwood branch and substitute for it the Hagger Leases branch, and also to form three short loop lines between the main line and the Croft and Yarm branches, appeared on the 13th of September.|| The plan deposited bore the name of Robert Stephenson as engineer, a circumstance due rather to the prosaic fact that

* Stockton and Darlington Railway Act, 1823.

† Minutes of committee meeting, 22nd March, 1823.

‡ *Minutes of Evidence on Stockton and Darlington Railway Bill*, 1828, p. 166.

§ Minutes of committee meeting, 22nd August, 1823.

|| *Durham County Advertiser*, 13th September, 1823.

George Stephenson could ill be spared from the works to attend the slow progress of the bill through Parliament than to any excess of "parental devotion," as stated by Mr. Jeaffreson.* Robert Stephenson *was* the engineer of the branch line, having with the assistance of John Dixon made the survey and prepared the estimates of the cost, and as such he was afterwards summoned to London, where he remained five weeks.

The bill was threatened from an unexpected quarter, and on very indefensible grounds. Lord Strathmore's trustees wanted the Company to stop short at Evenwood Bridge, because, if they went further, Mr. Prattman's collieries would enter into powerful competition with their own. Afraid of the opposition which would be created on the part of Lord Strathmore's trustees, the directors, on the 22nd of February, passed a resolution limiting the branch to Evenwood Bridge.† Mr. Prattman, on hearing what had been decided, then came forward and reminded them that their notices were for a branch to Hagger Leases Lane, adding that if they stopped short of that point he must necessarily oppose the bill.‡ The directors acknowledged that in justice to Mr. Prattman the branch should be carried to his collieries, and agreed that if he could get the necessary sanction he should have the line. He accordingly attended and, as a result of his representation, with the assistance of Mr. Lambton, who was carrying the bill through the House, a clause was obtained authorising the extension.§ The loop-lines had been dropped, and the bill, providing merely for the construction of the new branch and the raising of an additional £50,000, passed into law on the 17th of May.

While the Stockton and Darlington Railway Company were busy obtaining their third Act, they were anxiously watching the progress of another measure, notices for which had appeared on the 13th of September, 1823. This was the Tees and Weardale Railway, promoted by some of the gentlemen who had been connected with the so-called Northern Railway project of 1819. Their object was "to connect the extensive coal-field which lies in the south-west part of the county of Durham with the river Tees, in deep water, so as to facilitate the transport of coal to the sea for exportation."|| The railway, about twenty-six miles in length, was to begin at Willington in the valley of the Wear, and run first eastward across the Great North Road

* *Life of Robert Stephenson*, by J. C. Jeaffreson, vol. i., p. 55.

† Minutes of committee meeting, 22nd February, 1824.

‡ *Minutes of Evidence on Stockton and Darlington Railway Bill*, 1828, p. 14.

§ *Ibid.*

|| *Gentleman's Magazine*, vol. cxiv., part 1, p. 362.

near Sunderland Bridge, within three miles and a half of the city of Durham, then southward past Mainsforth, across Mordon Carrs, and afterwards in a south-easterly direction to Billingham Reach, four miles below Stockton. While following pretty closely the course of 1819 from Sunderland Bridge to Mainsforth, it diverged from it between that point and the Tees, to avoid passing through the Nunstainton estate, which had been purchased by Lord Eldon.

Considering that the projection of this railway was a breach of faith on the part of those who had entered into an agreement with them in December, 1819 (see p. 64), the directors of the Stockton and Darlington Railway petitioned against the bill. They were not, however, called upon to justify their opposition, for the Tees and Weardale party were defeated upon the standing orders, which had not been complied with.*

All this time the works of the railway had been steadily progressing under the superintendence of George Stephenson. Difficulties of course there were, inseparable from an undertaking of this magnitude—difficulties in raising huge embankments, one of them forty-eight feet high, in bridging streams and roads, and in forming a firm track across treacherous bog-land.

The earthwork had been let in lots to small contractors and sets of workmen, who formed temporary partnerships amongst themselves. Some of these navvies were keelmen who had been thrown out of work during the great strike of 1822.† So long as the nature of the ground was favourable all went well, but when, for example, the clay was strong and the season dry—contingencies for which there was, perhaps, no margin in the prices—the “undertakers” became discouraged and worked badly. In one case George Stephenson took upon himself the responsibility of advancing the price 1d. per cubic yard so that they might “go on cheerfully.”‡ Another set of navvies had executed 4,000 cubic yards of cutting between the Skerne and Coatham Lane at 4½d. per cubic yard, when they found they had made a bad bargain and threw up the contract.§

They evidently had made a bad bargain, for this piece of the line was afterwards re-let in two lots, the first at 7d. per cubic yard, the second at 5d.|| Myers Flat, a swampy tract in the next lot to the north, gave the contractor, James Potts, immense trouble. It was only after hundreds of tons of

* *Durham County Advertiser*, 22nd May, 1824.

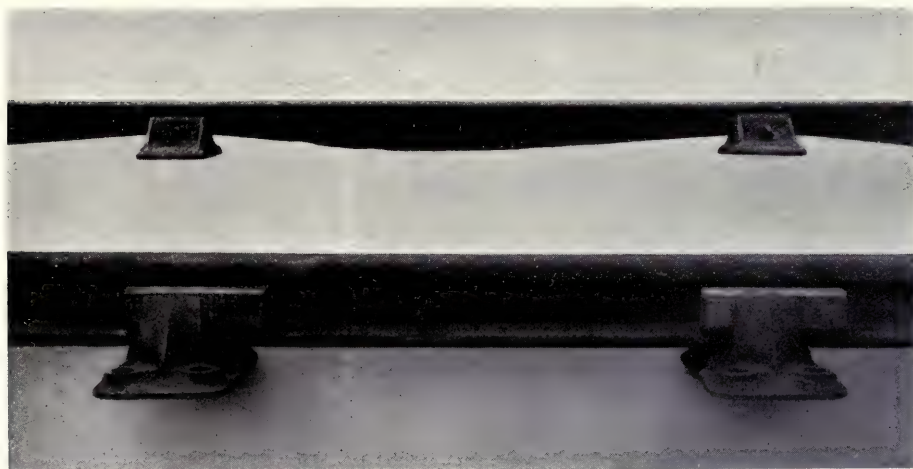
† *Newcastle Magazine*, December, 1822, p. 665.

‡ Letter of George Stephenson to the committee, 31st May, 1822.

§ Minutes of committee meeting, 19th December, 1823.

|| *Ibid.*

materials had been tumbled down that a stable foundation was secured for the road. The effect of this heavy mass sinking in the soft substance of the Flat was to force out of position the line of fences which had been erected previous to the beginning of the work. Though shifted back, the same thing occurred again and again, till some of the country people brought up in the neighbourhood of Middridge Hill—from time immemorial a favourite haunt of the fairies—attributed this derangement and obstruction of the railway works to the agency of the Little People and predicted that the line would never be made across Myers Flat.* A gratifying result of the cuttings had been the unexpected discovery of a valuable bed of limestone at Middridge,† which improved their prospects of traffic.



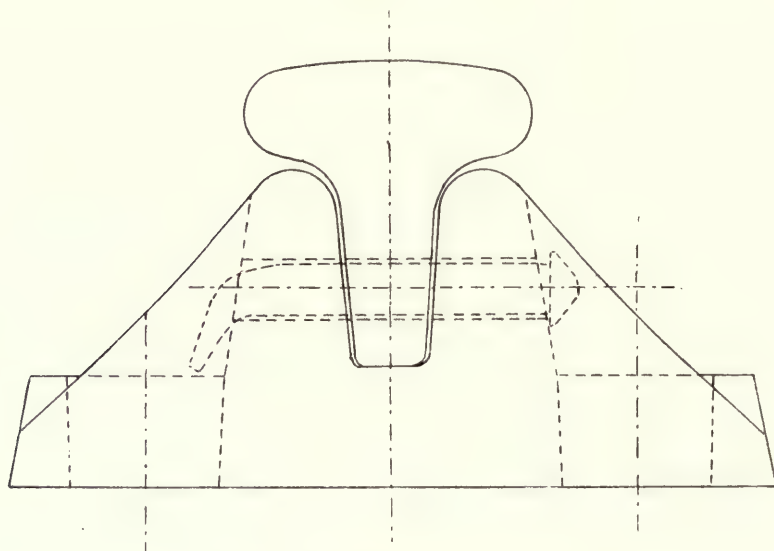
MALLEABLE IRON RAIL OF 1825 AND STEEL RAIL OF PRESENT DAY.

More than four-fifths of the rails laid were of malleable iron, rolled by the Bedlington Iron Company after Birkinshaw's patent. They were twelve feet and fifteen feet in length, of fish-bellied form, and weighed twenty-eight pounds to the lineal yard. The breadth of the top of the rails was two inches and a quarter, the depth at the end two inches and at the middle three inches and a quarter; the thickness of the web at the top was three-quarters of an inch, and at the bottom half an inch.

* *Northern Echo*, 25th September, 1875.

† Observations on the Practicability and Advantages of the Continuation of the Stockton and Darlington Railway from Croft Bridge to the City of York, 1827, p. 7.

Cast-iron rails had also been laid down, for the reason already given, on a portion of the main line, as well as in the "turn-outs" or passing places—about four miles in all*—though the directors had become more and more convinced from actual experience of the superiority of the malleable iron over the cast-iron rails. These cast-iron rails, which were supplied by the Neath Abbey Iron Works, were four feet in length, and weighed fifty-seven pounds and a half per yard; the breadth at the top was two inches and a quarter, the depth at the end four inches, and at the



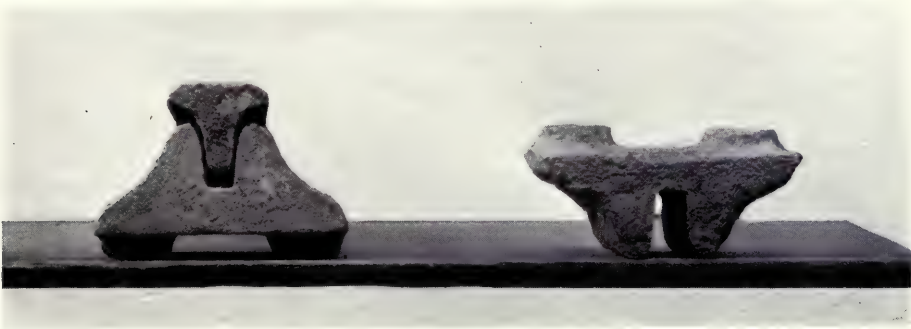
MODE OF SECURING RAIL TO CHAIR.

middle six inches, the thickness of the web at the top, five-eighths of an inch. Cast-iron chairs were used for both rails, the weight of those for the malleable iron rails being six pounds each, and of those for the cast-iron rails ten pounds each. The rail was fastened to the chair by passing a round-headed iron nail $3\frac{1}{4}$ inches long through holes in the web of the one and the jaws of the other and hammering downward the point end.†

* Second report from the Select Committee on Railways, 1839. Evidence of Joseph Pease and Samuel Barnard, Qn. 4,391.

† R. J. Semple's notes.

The sleepers, to which the chairs were secured by means of oak pins, were of two kinds. Between Etherley and Darlington they were stone blocks, a typical size being: length, eighteen inches; breadth, fourteen inches; depth, eight inches. The blocks were not, however, uniform in size, the length varying from eighteen inches to twenty-one inches, the breadth from twelve inches to fifteen inches, and the depth from seven inches to ten inches. Two holes, three quarters of an inch to an inch in diameter, were drilled into them by hand to a depth of five inches for the reception of the oak pins, and when boss-bottomed chairs were used, these holes were enlarged at the top to two inches in diameter, for a depth of half an inch, to admit of the chair lying level on the surface of the block. When finished the blocks cost in 1823 at the Brusselton Quarry, which belonged to the company, 5d., at Etherley Quarry, 6d., and at Houghton Bank Quarry, 8d. each.



BOSS-BOTTOMED CHAIR.

Economy dictated the use of the sleepers used between Stockton and Darlington,* sleepers peculiar to this railway. These were oak blocks from eighteen inches to two feet long, seven inches broad and five inches deep,† made from old ship timber and brought by water from Portsea to Stockton. They cost 6d. each. Stephenson would no doubt have preferred stone blocks, but weighing as these did from a hundredweight and a quarter to a hundredweight and three-quarters each, the cost of carting them from Brusselton and Etherley Quarries beyond Darlington would have been very considerable.

* "It will not be prudent to have more oak blocks than will reach Darlington, as stone will then be cheaper." George Stephenson to the committee, 31st May, 1822.

† Rastrick's Report to the Directors of the Liverpool and Manchester Railway, 1829, p. 27.

The utmost care had to be observed in the bedding of the blocks, whether of wood or stone, so that there should always be a perfect parallelism between the line of the base of the blocks and the rails. They were set squarely, not diagonally as on other railways of later construction.

Seven-eighths of the whole line (including sidings), on which malleable iron rails were used, contained fifty-three tons and a half of metal per mile, and one-eighth of the line, on which cast iron rails were used, a hundred



STONE BLOCKS *IN SITU*, ETHERLEY NORTH INCLINE.

and two tons. When it is remembered that the steel rails and chairs* on the North Eastern Railway weigh two hundred and thirteen tons per mile, some idea may be formed of the character of the permanent way of the Stockton and Darlington Railway in 1824. The ten-stone rail, fifteen feet in length, looks very slight in comparison with the twelve hundredweight rail of the North Eastern Railway forty-five feet in length; as does the six pound chair of the one with the forty pounds chair of the other.

* Rails and chairs of even a heavier type are now used, making the total weight of metal per mile 236 tons.

The rails and chairs of the Stockton and Darlington Railway cost per mile proportionately very much more than those at present in use, viz., £611 (for malleable iron rails at £12 10s. per ton, and cast iron chairs at £6 9s.) or £686 (for cast iron rails at £6 15s. per ton and chairs at £6 9s.) as against £1,010 (for steel rails at £5 5s. per ton and steel chairs at £3 15s.).

Though there was nearly as great a weight of stone as of metal in a mile of the Stockton and Darlington Railway—that is when stone sleepers were used—the cost of these blocks, 3,520 in number, was only £88; whereas, the cost of the 1,996 creosoted sleepers (9' × 10" × 5") which at present sustain the weight of the East Coast expresses does not fall far short of £400 per mile.



SECTIONS OF RAILS AND CHAIRS.

Between Witton Park and Shildon, the line had been enclosed with stone walls; between Shildon and Stockton with quickset fences.

Over the Gaunless the railway had been carried in 1823 by a light metal girder bridge, constructed by John and Isaac Burrell, of Orchard Street and South Street, Newcastle,* from a design which had been submitted by George Stephenson to the directors on the 28th of December, 1822. The Skerne was as yet unspanned, and some difficulty had been experienced in getting a foundation for the bridge.

Such was the state of the works in the spring of 1824, when there came from Liverpool and Manchester a deputation consisting of Joseph

* A firm in which George Stephenson was a partner until the 31st of December, 1824 (*Newcastle Courant*, 15th October, 1825).

Sandars, Lister Ellis, John Kennedy, and Henry Booth to make inquiries which would enable them to decide the question whether a railway between the two towns "would best combine the essential requisites of speed, economy and despatch."* What they learnt at West Auckland, Bedlington, Killingworth, and Hetton they communicated in a report to a meeting held at Liverpool on the 20th of May, when the scheme of a railway between Liverpool and Manchester was formally launched, and George Stephenson appointed the engineer to make the survey. Before the month was out, another deputation was on its way to Darlington, with a letter of introduction from Joseph Sandars to Edward Pease, this time from the Birmingham and Liverpool Railroad committee, and, as in the case of the former deputation, the visit was followed by a survey of the proposed line by George Stephenson, and the formation of a company (3rd September, 1824) to carry the project into effect.

Over the various works Mr. Pease and the other members of the sub-committee exercised a minute supervision. Not a step was taken without their cognizance: they gave their personal attention to the smallest details. With a sub-committee so vigilant, an engineer's position was not an easy one, especially when the works were giving trouble. George Stephenson appears on one occasion to have been ruffled by their intervention. This was in connection with the foundations of the Skerne Bridge. Under-estimating his natural resourcefulness, which supplied any lack of experience, they had suggested to him, on the 23rd of April, the expediency of his having a conversation on the subject with Ignatius Bonomi, a well-known architect of Durham, that such plans might be adopted for securing the foundations and building the bridge as might be the result of their united judgment.† To this suggestion, which implied a doubt as to his power to overcome the difficulty, Stephenson paid no heed, and on the 21st of May, the day after the memorable Liverpool meeting, he was diplomatically reminded of it, the committee trusting the engineer would not defer his journey longer than the following Monday (24th May).‡ He appears, however, to have seen Bonomi on the 18th and ascertained his views, both as to the plans of the bridge and the foundations for it. On the 11th of June the committee, being of opinion that it was of essential importance to the interests of the Company that the Skerne Bridge should be properly and securely built, resolved "that the

* *Account of the Liverpool and Manchester Railway*, by Henry Booth, 1831, 2nd edition, p. 10.

† Sub-committee minutes, 23rd April, 1824.

‡ *Ibid.*, 21st May, 1824.

secretary do write to Mr. Bonomi and request his professional assistance in executing the same.”* The architect proposed some alterations in the design of the bridge, and, on the 2nd of July, the committee approved of them and directed the bridge to be constructed according to his plan.† Four days later (July 6th) the foundation stone was laid by Francis Mewburn, one of the solicitors of the Company.‡ It was apparently intended to construct a metal bridge, as at West Auckland, but owing to the high prices of iron, combined with the reluctance of iron founders to tender for work of this kind, the bridge was ultimately built of stone, in accordance with the suggestion of George Stephenson.§



J. M. Sparkes, del.

W. Miller, sc.

SKERNE BRIDGE, STOCKTON AND DARLINGTON RAILWAY.

The completion of the works being now within measurable distance, the directors approached the question of locomotive engines. Although their intention to use them had been declared as early as 1822, and announced definitely to the Liverpool and Manchester deputation in the spring of 1824, it was not until the following July that they passed any formal resolution regarding them. On the 16th of this month they decided to apply to Messrs. Robert Stephenson and Co.|| for the terms on which they

* Sub-committee minutes, 11th June, 1824.

† *Ibid.*, 2nd July, 1824.

‡ *Newcastle Courant*, 10th July, 1824.

§ George Stephenson to Joseph Pease, 19th October, 1824. Jean's *Jubilee Memorial*, p. 55.

|| This firm, which was founded in 1823 to meet the prospective demand for locomotive engines, consisted of George and Robert Stephenson, Edward Pease, Thomas Richardson and

would make two locomotive engines, and George Stephenson was instructed to furnish the requisite specifications.*

The terms were £500 each, and this offer was accepted on the 16th of September.†

The stationary engines had been ordered from the same firm as early as the 23rd October, 1823, viz. :—One of thirty horse-power for Etherley Hill at £1,982 15s., and one of sixty horse-power for Brusselton Hill at £3,482 15s.‡ The designs for the latter were just finished by Robert Stephenson before he left for Columbia in June, 1824.§

During the second half-year of 1824 the works of the railway made comparatively little progress. This was owing (1) to the absence of the engineer whose services, it appears from a minute of the 10th of September, were so much wanted on some parts of the line, where the sub-committee thought the most evident neglect existed, that he was requested to come over immediately; (2) to the prevalence of unfavourable weather, especially to the violent rains and inundations of October, which damaged the bridge over the Gaunless and injured the railway generally. By the end of the year there were three miles of the main line still to form, and (including these) seventeen miles to ballast with stone and gravel. As to the Croft, Hagger Leases and Coundon branches, not a sod had been turned on any of them. So greatly had the estimates been exceeded, that the directors had been obliged to limit their expenditure to the completion and equipment of the main line.

At one part of the line, near Darlington, the works had been stopped for about a month, owing to the action of two of the trustees of the Darlington and Stockton road, bitter opponents of the railway. It had been found necessary, in order to preserve the gradual descent of the line, to raise the road about two feet as, at the point where the railway was planned to cross it, there was a slack or hollow. This alteration of the road, in reality an improvement to it, was for some reason or other objectionable to Major General Aylmer, of Walworth Castle, and John Allan, of Blackwell, and

Michael Longridge. The famous engine factory in Forth Street, Newcastle—one of the first economic results of railways—occupied at the outset less than an acre of ground on the east side of South Street. It began working in July 1823, and during that month supplied, to the order of the Stockton and Darlington Railway Company, the ironwork for 6 trams. The amount of the first fortnightly pay (26th July) was £12 2s. 2d.

* Sub-committee minutes, 16th July, 1824.

† *Ibid.*, 16th September, 1824. The price paid, however, was £600.

‡ *Ibid.*, 23rd October, 1823. § Smiles, *Lives of the Engineers*, vol. iii., p. 242.

these gentlemen, in their capacity of trustees, ordered the surveyor to have the soil and stones used in filling up the hollow removed. The Company's workmen were summoned for obstructing the public passage, and convicted in several penalties of 40s. by the two trustees, in their capacity of magistrates, who held that the Company had no power to raise the road. The hollow was once more filled up, and again were the materials removed. A second summons was issued, and, on the 23rd of August, it was agreed between the magistrates and the Company's solicitors that one of the men should be fined £5 on a second offence, and that the conviction should form the subject of a case for the opinion of a higher court. On the 6th of September, however, the Commissioners of the Road decided not to dispute the power vested in the railway company by their Act to raise or lower the road, and so this vexatious matter terminated.*

The year 1824 witnessed the rise and development of what has been termed the first "railway mania." For two years the Stockton and Darlington Railway Company, steadily carrying out their own plans, had been making a great experiment for the rest of the country, and men of discernment had recognised its practical import, and come forward with similar projects. These started into notice in the public papers almost weekly; many of them designed to intersect the country to its full extent, over hills and valleys in various directions.† It was estimated that there were twenty new railway schemes in agitation, representing a capital of £13,950,000, at the beginning of 1825.† The most ambitious in conception was, perhaps, the London Northern Railroad Company, launched on 13th December, 1824, with a capital of £2,500,000, "to connect Birmingham, Derby, Nottingham, Hull and Manchester with each other, with the parts adjacent and with the metropolis."§ Even the East Coast route was anticipated in a proposal, communicated by William Bell, of Edinburgh, to the mayor of Newcastle-upon-Tyne, to establish, by way of that town, a railroad from Edinburgh to London, "of all the irrational schemes that have yet been broached," said the *Tyne Mercury*, "surely the most absurd."||

Another "grand trunk railway" between London and Edinburgh had, however, been suggested several months before this, for the conveyance of goods and passengers by means of locomotive and stationary engines, the

* *Durham Chronicle*, 11th September, 1824.

† *Gentleman's Magazine*, February, 1825, p. 114.

§ *Tyne Mercury*, 4th January, 1825.

† *Tyne Mercury*, 15th February, 1825.

|| *Ibid.*, 25th January, 1825.

proposed line being taken past Bedford to Leeds, leaving, a little on the west, the towns of Northampton, Leicester, Loughborough, Nottingham, Mansfield, Chesterfield, Sheffield and Barnsley, and, on the east, Huntingdon, Stamford, Worksop, Doncaster and York, and, in its course northward of Leeds, passing at nearly equal distances between Carlisle and Newcastle.* The nation was said to be "railway-mad" and "unquestionably," wrote Edward Baines in the *Leeds Mercury* of 24th December, 1824, "the rage of speculation has taken so decided a turn in this direction, as to present several symptoms of the popular delusion which sometimes arises out of a strong and general excitement of the most active passions of human nature."

The North of England especially—the home of railways—could scarcely remain indifferent to such a movement. An unsuccessful attempt was made by some of the proprietors of the Berwick and Kelso Railway, to get their act of 1811 put into execution:† a project was also on foot to continue this railway up the Tweed to Melrose, and thence to Dalkeith and Edinburgh.‡ Two lines were promoted at this time which now form part of the North Eastern Railway system: one, fifty-one miles in length, intended to connect Leeds with Hull, the other, sixty-four miles and a half in length, to unite Newcastle and Carlisle.

The Leeds and Hull scheme was launched at a meeting, of which John Marshall, the member for Yorkshire, was chairman, held in the Leeds Court House on December 29th, 1824, when the "Leeds and Hull Railroad Company" was formed, with a capital of £500,000.§ It was really part of a greater scheme for the establishment of a continuous railway communication between the Irish Sea and the German Ocean. The Liverpool and Manchester Railway Company had been formed seven months earlier for the purpose of constructing the western portion of this line, and another company, the "Manchester and Leeds Railroad Company," came into existence seven days later (January 5th, 1825) with a proposal to complete the communication. The engineer appointed by the Leeds and Hull committee was George Stephenson, who recommended that the line of railway should be a double one, worked by locomotive engines running at a speed of eight miles an hour.|| The survey, under his direction, was begun on the 7th of February

* *Durham Chronicle*, 2nd October, 1824, quoting the *Caledonian Mercury*.

† *Durham County Advertiser*, 25th December, 1824.

‡ *Tyne Mercury*, 11th January, 1825.

§ *Leeds Mercury*, 1st January, 1825.

|| *Ibid.*, 29th January, 1825.

by Joseph Locke, who, in the absence of his chief, set out the whole line himself. Locke levelled the portion from Leeds to Selby; Fordham, another of Stephenson's assistants, that from Selby to Hull.*

The projectors of the railway anticipated a scramble for the shares and, in view of that contingency, adopted some general principles of selection and laid down some curious conditions. In apportioning the shares they decided to give the preference to those who were likely to bring business to the railway, especially to those resident within the borough of Leeds or in the towns of Hull and Selby. But to obtain shares it was necessary to secure the approbation of the committee: the number which might be held by one individual was limited to twenty, and none of these could be transferred until after the passing of the Act. A thousand shares were reserved until accurate estimates of the expense had been obtained. Five hundred were offered to the inhabitants of Hull and neighbourhood, and one hundred to the inhabitants of Selby and neighbourhood.† The scheme was inadequately supported and for some years was laid aside, partly on account of the "distress of the times," and partly because the promoters, like the cautious Yorkshiremen they were, wished to see how the Liverpool and Manchester Railway would answer, and to benefit from the engineering experience which might be gained during the execution of that work.‡

The Newcastle and Carlisle scheme, the outcome of a long agitation to improve the communication between the eastern and western seas, under the impulse of this first great railway movement, was carried forward without break of continuity, and it is therefore necessary to take up the thread of its story at this point.

A ship canal, about eleven miles in length, had been opened on the 12th of March, 1823, between the Solway Firth and Carlisle, and the wish expressed on this occasion, in the form of a toast, that the Carlisle canal might soon extend to the Tyne,§ met with a general response on the banks of the Eden. While the feasibility of the project was under discussion, William Chapman, the engineer of the canal, directed public attention to the advantages of a railroad, and recommended that mode of conveyance in preference to a canal.|| Shortly afterwards, on the 21st of August, 1824, a county meeting,

* Minutes of evidence on Newcastle and Carlisle Railway Bill, 1829, p. 158.

† *Leeds Mercury*, 1st January, 1825.

‡ *Ibid.*, 10th February, 1827, paragraph, "Proposed railway from Croft Bridge to York."

§ *Newcastle Magazine*, April, 1823, p. 219.

|| Letter from Mr. Chapman to Sir James Graham of Kirkstall, bart., 10th May, 1824. Supplement to above letter, 21st July, 1824.

convened and presided over by the High Sheriff of Northumberland, was held in the Moot Hall, Newcastle-upon-Tyne, to consider the scheme of “a *communication by railways* between Newcastle and Carlisle.” A resolution had been prepared in favour of this mode of conveyance, but it was so vigorously opposed by Mr. William Armstrong (father of the first Lord Armstrong), an advocate of the canal, who “implored the meeting to reject their spiritless proposition for a railroad,” that it was dropped, and at the suggestion of Sir M. W. Ridley, a committee of inquiry was appointed to report on the best means of improving the communication.*

At the request of this committee Mr. Chapman drew up a report, dated October 27th, 1824, on the cost and separate advantages of a ship canal and a railroad from Newcastle to Carlisle. His estimate for the former was £888,000, a sum which he considered would “show to any dispassionate mind the impropriety of any longer entertaining the idea of a ship canal; and that only practicable for vessels provided with striking masts.”† The latter, he calculated, would cost £252,488, and the line which he recommended for it was from the west end of the Close at Newcastle along the north bank of the river to Lemington and the haughs below the village of Newburn, across the Tyne to Ryton Haughs, and thence by way of Hexham, Haydon Bridge and Glenwhelt, when, avoiding Naworth Park, it continued to the north of the Irthing past Lanercost Abbey, across the river near Ruleholme and straight onward to Carlisle. Chapman’s views were confirmed by Josias Jessop, another engineer who had been consulted on the subject, in a report dated March 4th, 1825.

Guided by these professional opinions, the committee declared in favour of a railway, and, at a county meeting held in the Moot Hall, Newcastle, on the 26th of March, 1825, at which their report was presented by Sir John Edward Swinburne, Bart., the chairman of the committee, resolutions were passed expressing the fullest concurrence with their views. From this time forward there was no longer any question of a canal. The railway had triumphed on the banks of the Tyne as it had triumphed six years earlier on the banks of the Tees.

At the close of the county meeting, another meeting was held of prospective subscribers, with Addison John Cresswell Baker in the chair, when the Newcastle-upon-Tyne and Carlisle Railroad Company was formed,

* *Tyne Mercury*, 24th August, 1824.

† Report on the Cost and Separate Advantages of a Ship Canal and of a Railway from Newcastle to Carlisle, 1824, p. 7.

with a capital of £300,000, and a prospectus was adopted at the same time and ordered to be circulated. Directors were appointed on the 9th of April, 1825, with John George Lambton, afterwards Earl of Durham, at the head of the list, and they held their first meeting on the 23rd of April.

There was an eager demand for shares. So rapidly were these taken up that the Mayor of Newcastle, not being able to obtain at once the Town Council's sanction to contribute to the success of the undertaking in this practical way, had to make a request to the directors on the 30th of April that the power of subscribing to the extent of fifty shares might be reserved to the Corporation of Newcastle.* The subscription list was filled up on the 6th of May, and on the 7th the shares were at a premium.†

During this period of excitement, Durham was still in the van of railway enterprise. The promoters of the Tees and Weardale railroad had not been discouraged by their rebuff in 1824. Strengthened by the adhesion of Christopher Tennant and his friends, who had up to this time kept aloof from them, intending to revive themselves the project of 1819, they had altered the course of their line to avoid opposition, and given notice of another application to Parliament. The scheme, as described in the public announcement of the 13th November, 1824, was for a railway or tramroad from the river Tees at Haverton Hill to Willington in Weardale, with two branches, one from Billingham Mill to Stockton, the other from Bog Hall to Sedgfield.

The Stockton and Darlington Railway Company, at an adjourned general meeting held on the 24th of January, 1825, decided to unite with the Marquis of Londonderry, Mr. Lambton, Mr. Robert Surtees (of Mainsforth) and Mr. Richard Wright (of Sands House) in again opposing the bill, and on the same grounds as before, viz., that the project was a violation of the agreement which the promoters of the bill had previously made with them. The real opposition came from the coal-owners of the Tyne and Wear, who were afraid that the railway would enable the collieries of South-west Durham to compete with their own. Their petition against the bill was presented by Sir M. W. Ridley, and their battle was fought by Lord Londonderry and Mr. Lambton. The objections advanced by Lord Londonderry were that the railway passed inconveniently near Wynyard. It was admitted that he could not see the railway from the highest part of his house, but it was urged that the noise of the locomotive engines would be heard in every

* *Tyne Mercury*, 3rd May, 1825.

† *Ibid.*, 10th May, 1825.

room of it.* Mr. Lambton's reason for his unfriendly attitude to the bill was that "he did not consider the public benefit to be derived from it could compensate for the private injustice it would occasion,"† and he attempted to shake the grounds on which the city of London upheld the bill, viz., that coal of a superior quality would be introduced by means of the railway into the London market. The prejudices of the landed gentry against the new mode of conveyance were amusingly illustrated by Lord George Cavendish. As he did not think that the coal was so excellent as it was supposed, "he would not," he said, "have the country harassed and torn up by these infernal railroads."‡ So determined was the opposition that on the 10th of May, after a struggle of fourteen days, the bill was thrown out by a committee of the House of Commons.

There were signs that a strong anti-railway movement was springing up. Associations even were formed, in various counties, of the landed, canal and turnpike road interests of the kingdom, to oppose the "ten mile an hour railways" on the ground of their being great public, as well as private nuisances without commensurate advantages.§

While it was felt, however, throughout the country that railways, objectionable though they might be to some few privileged persons, would have to be tolerated, there was a growing antipathy to the use of locomotive engines. This had been manifested in the debate on the Tees and Weardale Railway Bill, when they were described by Mr. Davenport as "infernal machines." Again, when the Liverpool and Manchester Railway Bill was before the House, Thomas Creevey, in one of his letters, referred to "this infernal nuisance—the loco-motive Monster carrying Eighty Tons of goods, and navigated by a tail of smoke and sulphur."|| The objectionable noise it would make near Lord Londonderry's house was one of the reasons which led the committee of the House of Commons to reject the Tees and Weardale Bill. Juries, in assessing the value of the land intended to be used for the purposes of a railway, took into account the damage sustained by the rest of the property from the proximity of locomotive engines. A case in point was that of *John Russell Rowntree v. the Stockton and Darlington Railway*, which came up before the adjourned sessions at Durham on the 2nd of April, 1825, a case which occupied nearly seven hours and created great interest. Mr. Rowntree, though a shareholder of the Company, had been one of the few landowners

* *Durham County Advertiser*, 19th March, 1825.

† *Ibid.*

‡ *Ibid.*

§ *Durham Chronicle* of 3rd February, 1825, quoting *Doncaster Gazette*.

|| *Creevey Papers*, 1903, vol. ii. p. 88.

with whom the directors had been unable to come to terms. For a small quantity of land at Whiteley Springs, in the parish of Egglescliffe, having an area of 1 acre 2 roods 6 perches and valued by eight independent land surveyors at sums varying from £200 to £320, he wanted £700; the Railway Company offered him £350; the jury, influenced by the statement of the plaintiff's counsel that perhaps the greatest nuisance of all would be "the locomotive or, as they have been called, infernal machines—which from their presence so near to Mr. Rowntree's house, would render the premises useless to the owner," awarded him £500.* William Chapman could not recommend the Newcastle and Carlisle Railway Company to use locomotive engines unless "*much improved beyond what they are.*" "They are objectionable," he pointed out, "in various ways. In the first place, gentlemen, through whose estates or near whose residences they pass, object to their appearance and the noise and smoke arising from them. Whilst new, and on level planes, they possess advantages in expedition; but by their quick motion, and that degree of shaking which cannot be avoided, they in the end require so much and so frequent repairs as to render their advantage dubious; exclusive of their being unfitted to receive and discharge the carriages that are wanted to be taken forward, and sent off aside in such places of the line as do not coincide with their stages or feeding places."†

With this prejudice and depreciation it is refreshing to contrast the enthusiastic prediction of a Welsh surveyor, T. G. Cumming, who visited the North of England in the autumn of 1824. "In all probability," he wrote, "the period was not far distant when the benefits and advantages likely to be derived from its use will not only be more generally known and appreciated, but so extensively practiced in the conveyance of passengers and merchandise by land as to supersede, in a great degree, the use of all other modes of conveyance."‡ That period, indeed, was not far distant, and within a few months of the publication of Cumming's treatise, the first locomotive engine to be employed on a public railway was taking shape in a small manufactory in Newcastle-upon-Tyne, and the directors of that railway had engaged the first locomotive superintendent, Timothy Hackworth, who was to achieve so much with steam-power on the iron road. By the

* *Durham County Advertiser*, 9th April, 1825.

† Mr. Chapman's Report on an Improved Line of Railway from Newcastle to Carlisle, 16th June, 1825.

‡ Illustration of the Origin and Progress of Rail and Tram Roads and Steam Carriages, 1824, p. 6.

middle of this eventful year, 1825, it was no less evident to shrewd observers that railways had fallen in public estimation than that "the revived good opinion of them as to the conveyance of goods, etc., would a good deal depend upon the performances and success of the Darlington railroad."* From various parts of the country anxious looks were, therefore, directed towards South Durham.



"LOCOMOTION," 1825.

America also at this time was manifesting an interest in the railway and, among those who watched most eagerly, note-book in hand, the process of fixing the rails and forming the road and side tracks on the Stockton and Darlington Railway, observing how the waggons laden with rails, chairs, stone sleepers, workmen's tools, etc., for the formation of the line, and with stones and gravel for the ballasting of it, kept pace with the work as

* Letter from Thomas Hill, Leeds, to the committee, 21st July, 1825. N.E.R. Muniments.

it advanced, was William Strickland, architect and engineer, sent by the Pennsylvania Society for the Promotion of Internal Improvement to report on the canals, railways, and roads of the mother country.*

The works, however, progressed slowly, and it was not until the 12th of July that the committee of management could decide on a date for the opening ceremony. The line was traversable throughout about a month afterwards, though insufficiently ballasted in certain parts owing to the difficulty in obtaining stones and gravel. On the 16th of September, the second of the fixed engines, the delivery of which had been unduly delayed, was ready for trial at Etherley, and, on the same day, "Locomotion," described by Stephenson as "the improved travelling engine," left Newcastle on a waggon drawn by a team of Pickersgill's horses, and was taken by road to the level crossing at Aycliffe Lane where it was placed on the railway, a fire, it is said, being subsequently kindled in its flue by means of a workman's burning-glass.†

On the 17th the newspapers contained the official announcement of the formal opening of the railway on the 27th of the month, and two days later a handbill was issued giving further details of the arrangements.

It was with no ordinary satisfaction that the directors prepared to celebrate what they rightly regarded as a national event. The financial condition of the Company, to which reference had been made in the report of the 9th of September, afforded the strongest of reasons for bringing the line into immediate use. Their expenditure had exceeded the estimates in every department. Land and compensation to tenants alone had cost them £18,000 more than they had anticipated, and the outlay under the head of contingencies, which included such items as a temporary self-acting plane at Brusselton Quarry (£2,000) had been unexpectedly large. The works had swallowed up nearly the whole of the authorised capital, as well as £60,000 which had been borrowed on the promissory notes of the Company. There was, moreover, at the time when the accounts were made up, viz., 25th July, 1825, a balance due to the treasurer of over £7,500, and, to add to the embarrassment of the directors, the holders of the Company's notes had given notice that they would require the repayment of their loan of £60,000 within six months. With staiths, depots and engine sheds still to construct and branches to lay down to Coundon, Croft Bridge, and Hagger Leases Lane, it

* Strickland's *Reports on Canals, Railways, Roads, etc.*, 1826, pp. 26 and 27.

† Letter from Robert Metcalf to Henry Pease. *Diaries of Edward Pease*, 1907, p. 379.

had been, of course, impossible to entertain a proposal made to them in August by a deputation from the North Riding of Yorkshire, that they should extend their Croft branch across the Tees to a farmhouse called Standalone, a distance of a mile, from which place it was intended to make a railway to the neighbourhood of Richmond.

On the eventful 27th of September the lines ready for opening were the following:—

	Miles.
Main line from the Phoenix Pit, Old Etherley Colliery, to Cottage Row, Stockton	25
Darlington Depôts Branch	$\frac{1}{2}$
Yarm Branch	$\frac{3}{4}$
Part of Hagger Leases Branch	$\frac{1}{2}$
	<hr/> *26 $\frac{3}{4}$

For the first 20 miles from Stockton the nature of the country was favourable to the railway, and the gradients did not exceed 1 in 104; further west the line had to pass over two great ridges, one 512 feet 8 inches and the other 583 feet 6 inches above lowwater mark in the Tees, and the gradients were necessarily very severe—on the Brusselton inclines, 1 in 30 $\frac{1}{2}$ and 1 in 33 $\frac{1}{2}$, and on the Etherley inclines 1 in 30 $\frac{3}{4}$ and 1 in 33.[†]

The rolling stock of the Company on the 26th of September, 1825, consisted of one locomotive engine, a railway coach and nearly 150 waggons; with this modest equipment they proposed to become the principal carriers on the line.[‡] On the evening of this day the coach, which had just arrived from Newcastle, where it had been built to the order of the Company, was attached to “Locomotion” at Shildon, and a select company, consisting of Edward Pease and his three sons, Edward, Joseph and Henry, two other members of the committee—Thomas Richardson and William Kitching, together with George Stephenson, made a trial trip as far as Darlington, James Stephenson (George Stephenson’s elder brother) driving the engine.[§] This was the first time a locomotive engine had drawn a carriage constructed for the conveyance of passengers on a public railway.

* Portions of the main line, 5 $\frac{1}{2}$ miles in all, and the Yarm branch, have long since been disused.

† Tables of gradients to Bradshaw’s Map of the Railways of Great Britain, 1839, p. 17.

‡ Report of the general committee to meeting held on 9th September, 1825.

§ *Northern Echo*, 25th September, 1875. Henry Pease, a short story of his life, by M(ary) H. P(ease), 1897, p. 13.

When the day of the opening came—a Tuesday—it was evident that the prejudices which had existed against the railway on the part of land-owners and farmers and those engaged in the leading of coal were not shared by the other classes of the community. From one end of the line to the other there was a general desire throughout the whole countryside to take part in the day's proceedings. So early as half-past five o'clock in the morning hundreds of vehicles of all kinds were moving in the direction of the Gaunless valley; on the railway, waggons fitted up with seats and drawn by horses, conveying strangers and workmen; on the roads, post-



From The Engineer, 1875, p. 214.

FIRST IRON RAILWAY BRIDGE.

chaises containing the directors and shareholders of the Company and their friends, gentlemen's carriages, jaunting cars, carriers' waggons and carts, all filled with eager sightseers.

In one or other of these conveyances, on horseback, mounted on broken-down hacks and donkeys, or on foot, came the units of the vast throng assembled at St. Helen's Auckland, to see the first waggons pass from the top of Etherley Ridge to the top of Brusselton Ridge, a distance of over three miles, by means of three out of the four methods of conveyance in use on the railway, and to join in the triumphal procession which was to be formed on the flat between the ridges.

There was one feature of engineering interest at this point which the crowd could not fail to notice on account of the novelty of its design, and that was a curious little girder bridge over the Gaunless—the first iron railway bridge in the world, now removed to Darlington. It crossed the river at this time on four spans of twelve feet six inches each. Originally there were three, but after the flood of the 10th October, 1824, it was found necessary to add a fourth. Each girder was of wrought iron, and consisted



ETHERLEY NORTH INCLINE (SHOWING CHIMNEY OF STATIONARY ENGINE).

of two segmental arches, one curving upward and the other downward, their ends uniting, at the point of intersection, in a cast-iron boss: vertical tie-rods cast round both members were extended upward to form a support for the way-beams. The whole structure rested on three piers, each of two cast-iron columns braced together.

Small and unimportant as it was, the bridge bore the impress of Stephenson's genius, and it is interesting to trace the principle of its design in Herr Lohse's magnificent "double-bow girder bridge" over the Elbe

above Hamburg,* in which, however, the roadway, instead of being supported above the arches, is by means of the tie-rods suspended below them.

Between seven and eight o'clock twelve waggons of coal were led from the Phoenix Pit to the foot of Etherley Ridge, and forthwith drawn up the North Bank, 1,100 yards in length, by the stationary engine at the top. Down the Etherley South Bank—a self-acting inclined plane—they descended to the turnpike road at St. Helen's Auckland. Here they were joined by another waggon filled with sacks of flour, and then led by horses across the flat to the foot of Brusselton West Bank. This was the second great point of interest on the line, and thousands of spectators were waiting on the slope of the ridge below Brusselton Tower to see the working of the 60 horse-power stationary engine.

About eight o'clock the loaded waggons, on which several persons had seated themselves, were drawn up the great incline by means of a rope in one piece, 1,850 yards in length, at the rate of eight miles an hour, and, shortly afterwards, let down the eastern side of the ridge by means of another rope, 825 yards in length. At Shildon Lane End stood the now celebrated locomotive engine—No. 1—in a bright coat of fresh paint, getting up steam; twenty-one new waggons, provided with seats; and the first railway carriage, the "Experiment," which, according to a contemporary account of the Opening, was "fitted up on the principle of what are called the Long Coaches, the passengers sitting face to face along the sides of it."†

For a description of this historic vehicle we have to fall back upon the coachmaker's bill which contains the following details:—"One coach body fit up with a door at each end, glass frames to the windows, a table and seats for the inside, top seats and steps." From the same source we learn that the coach was cushioned and carpeted, and, from another source, that the name of the coach and the Company's motto were painted on the outside. The underframe, made by R. Stephenson & Co., was supported on cast-iron wheels without springs. A carriage with a table between the two seats must have been of a fairly good width, certainly not less than 6 feet, and would consequently have the wheels underneath the frame. No reliance whatever can be placed on the well known woodcut in the 1860 edition of Smiles' *Life of George Stephenson*, in which the "Experiment" is represented rather as a showman's caravan, rudely constructed, than as the "elegant covered coach" of the Newcastle journalist. From the position of the wheels outside

* For views of this bridge see *Engineer*, 6th February, 1880, pp. 104 and 108.

† *Durham County Advertiser*, 1st October, 1825.

the frame, the absence of roof seats and steps and the crude character of the design it is evident that the vehicle portrayed is a mere travesty of the "Experiment" coach which was built by experienced hands at a cost of £80.

Some time elapsed before the train was made up and ready to start. Accommodation had been provided for 300 passengers—sixteen or eighteen in the coach, and twelve and thirteen in each waggon. But the ticket-holders formed only a small section of those who wished to travel, and there was a wild rush for seats. Eventually 450 persons, according to one account, or 553, according to another, found sitting or standing room, and the men appointed to attend to the brakes—distinguished by a broad blue sash over the right shoulder fastened in a knot under the left arm—having taken their places between the waggons, the signal was given and the long train, preceded by a man on horseback bearing a flag, and followed by twenty-four waggons filled with workmen and others, these being drawn by horses, moved off amid loud huzzas from the crowd, in the following order:—

The locomotive engine, driven by George Stephenson.

Tender, with water and coals.

Six waggons loaded with coals: passengers on the top of them.

One waggon loaded with sacks of flour: passengers amongst them.

One waggon containing the surveyors and engineers.

Coach, occupied by the directors and other proprietors (members of the Pease family unfortunately absent owing to the death of Edward Pease's youngest son, Isaac, that morning.)

Six waggons filled with strangers.

Fourteen waggons packed with workmen and others.

Six waggons loaded with coals: passengers on the top of them.

Four flags streamed in the breeze, bearing suitable inscriptions: (1) "Stockton and Darlington Railway opened for public use, 27th September, 1825. *Periculum privatum: utilitas publica*"; (2) the Company's motto only; (3) "Prosperity to the Stockton and Darlington Railway"; (4) "May the Stockton and Darlington Railway give public satisfaction and reward its liberal promoters." Beneath the inscription on the first flag—a large white one—was painted a landscape, having in the foreground a representation of the locomotive engine drawing several waggons of coals.

The gradients for some distance from Brusselton East Bank foot were very favourable, descending at the rate of 1 in 144 for a mile, and of 1 in 128 for the next mile and a half, and the little locomotive engine, with a load of

100 tons in the rear of it, fifteen times its own weight, soon attained a speed of from ten to twelve miles an hour. In vain did a number of gentlemen, mounted on well-trained hunters, press forward over hedges and ditches on both sides of the line in order to accompany the procession; they were unable to keep pace with the iron horse.

But while the baffled horsemen were dropping behind, a waggon—that containing the surveyors and engineers—left the rails, owing to one of the wheels not having been set properly on the axle, and the whole train was brought to a standstill. Replaced on the rails the waggon shortly afterwards slipped off a second time, and orders being given to remove it altogether, it was being shunted into a siding when a bystander was unfortunately struck by it and injured in the side. In the neighbourhood of Simpasture another stoppage occurred, in consequence of some oakum having got into the feed pump of the engine. Trivial as was the cause of the stoppage, it detained the procession thirty-five minutes. From Simpasture to Darlington, a distance of six miles, the train travelled along without any further mishap, crowds of spectators at every lane end watching its progress with wonder and delight.

From Burtree Lane to Darlington, a distance of a mile and three quarters, there was a falling gradient of 1 in 135, and, on this portion of the line, it was ascertained that the engine would travel with perfect safety at the rate of fifteen miles an hour, a fact duly noted, no doubt, by the representatives of the projected Liverpool and Manchester, Birmingham and Liverpool, and Leeds and Hull Railway Companies, who were present in the train.

Shortly afterwards the engine, sweeping round a curve of three-quarters of a mile radius, drew up near the junction of the Darlington branch with the main line, having accomplished the first part of its journey—eight miles and a half—in two hours, but, deducting fifty-five minutes for the stoppages, the time actually spent in travelling was sixty-five minutes, which gives an average speed of 8 miles an hour.

An immense crowd, numbering it was supposed, from ten to twelve thousand persons, had assembled at this point to witness the arrival of the train. Practically the whole population of Darlington was there, rejoicing at the completion of the great undertaking which had occupied their thoughts for so many years.

Six waggons laden with coals were detached from the train and, with the waggons filled with workmen which had followed behind, were taken down the “run” to the depots; the coals to be distributed among the poor,

the workmen to be regaled with victuals and ale. Two other waggons, containing Mr. Meynell's Yarm band, were then attached to the train in the rear of the coach. Many of the passengers who had joined the train at Brusselton went no further than Darlington, and their places were taken by others. Half an hour was lost in effecting these changes and rearrangements. A little after half-past twelve o'clock No. 1, its boiler replenished with water from the Company's reservoir, made another gallant start, and the train, which now consisted of thirty-one vehicles with 550 passengers in or about them, moved steadily onward to the music of the Yarm band: affording, as it crossed the Skerne Bridge—the chief architectural feature on the line—a novel subject for an artist's pencil carefully noted by one of the younger sight-seers, John Dobbin, of Darlington,* who, in later life made not only a graphic drawing of the scene, contrasting very cleverly the vehicles on the railway with the stage-coach and goods waggon on the road, but depicted with much spirit the various groups of spectators as they stood, attired in the quaint costume of the period, gazing with wonder at the iron horse.

For five miles out of Darlington there was a fall of only 57 feet, and, on this portion of the line, the hauling capacity of the engine was tried. The weight of the train was between eighty and ninety tons, and, with this load behind it, "Locomotion," receiving but little assistance from gravity, was able to run at the rate of about four miles an hour, a performance which, according to the editor of the *Newcastle Courant*, "excited the astonishment of all present." This speed was more congenial to the horses in the procession, drawing waggons crammed with passengers, than the previous record.

At Goosepool the engine pulled up to take in a further supply of water, and this was the only stoppage in the course of the journey.

Near Whiteley Springs, where the railway crossed the turnpike road from Stockton to Yarm, at a distance of two miles and three-quarters from the terminus, there was a dense mass of people awaiting the arrival of the train, and as it swept round the curve and ran parallel with the road for some distance past the grounds of Preston Hall, a miscellaneous assemblage of carriages, gigs, carts and other vehicles and a cavalcade of horsemen

* The drawing is stated to have been based on a sketch made at the time. As, however, in 1825 John Dobbin was only 10 years of age, it is probable that the sketch was made by his father, a weaver by trade, who appears to have had an artistic bent. (*Ex inf.* R. J. Semple and T. Wood.)

To face page 112.

PLATE VI.



Painted by John Dobbin.

View of the Opening of the Stockton and Darlington Railway.

Photo by Cooper, Darlington.

accompanied it, in some places within a few yards of the rails, "without the horses," states one eye-witness, "seeming the least frightened."*

The same writer, Joseph Armstrong, afterwards Mayor and Sheriff of Newcastle, also noted a suggestive incident which occurred at this part of the journey. While the train was still running in close proximity to the road, the stage-coach came dashing up and passed alongside, the respective passengers cheering each other; and the crowd had the pleasure "of observing the striking contrast exhibited by the power of the engine and of horses: the engine with her six hundred passengers and load, and the coach with four horses and only sixteen passengers."† It was but for a very short distance that the old order and the new, as represented by the coach and the railway carriage, were together side by side, for almost immediately afterwards the railway parted company with the road—significantly it would seem—and there being a descent from this point of 1 in 104 for the first mile and a quarter, the motion of the train was accelerated, and it rushed onward to Stockton at a speed of 15 miles an hour. Unfortunately, a keelman, who had clung for some time to the waggon in front of the coach, stumbled and fell, and a wheel of the coach went over his foot, dreadfully crushing it. This was the only accident that happened, though not the only one that was feared, for it was found quite impossible to restrain the enthusiasm of the crowd collected on the railway. Triumphant was the entry of the train, three hours and seven minutes after leaving Darlington, and pæan-like was the salute thrice repeated, which was fired from the seven eighteen-pounders on the Company's wharf upon its arrival at the terminus near Cottage Row. Then the Yarm Band, which had been playing most of the way to Stockton, struck up "God save the King," the crowd responding with "three times three stentorian cheers," and so the memorable journey came to an end.

There was good cause for rejoicing: the weather had been propitious, the opening ceremony, though marred by two regrettable incidents, had been a brilliant one, the fixed engines had worked well, "Locomotion" had displayed what then seemed almost miraculous powers—some of the spectators wondering if the engine moved by lawful means—the public utility of the railway had been demonstrated in the presence of 40,000 or 50,000 people, many prejudices had been dissipated, and the success of the enterprise was assured.

* *Newcastle Courant*, 1st October, 1825.

† *Ibid.*

Alighting from the coach and waggons at the coal wharf, and leaving engine and train to the inspection of the crowd, the directors and their friends, preceded by the band and the proudly beribboned men who had acted as guards or brakesmen in the waggons, marched two and two in procession to the Town Hall, where, an hour later, a company of 102 sat down to dinner, Thomas Meynell, of Yarm, in the chair, supported on his right by his wife's nephew, William Wright, of Kelvedon, and on his left by William Thomas Salvin, of Croxdale. The Mayor of Stockton, John Wilkinson, occupied the vice-chair.

The toast-list was a long one: it comprised twenty-three items, all of which were duly honoured, from the "King" to "George Stephenson, the Company's surveyor." Not only did the company drink success to the Stockton and Darlington Railway, but to the Liverpool and Manchester, and the Leeds and Hull Railways, which existed only as projects. It was felt by the representatives of these companies, and the conviction was expressed by one of them, "that facility of communication by means of railways had been fully established by the experiment of that day."* This was the distinctive achievement of the Stockton and Darlington Railway. A coach had been attached to a locomotive engine and drawn on a tramroad twenty years before the "Experiment" and "No. 1" were thought of—this was at Merthyr Tydvil on the 20th of February, 1804†—even the conveyance of passengers by rail was no new thing in 1825: a stage-coach was then plying daily with passengers on a tramroad between Swansea and Oystermouth, a distance of seven miles, and this traffic formed indeed its chief source of revenue.‡ Passengers seem also to have been conveyed on the Kilmarnock and Troon Railway at an early period,§ though the carriages—"diligences" they were called by Baron Dupin in 1818, "not unlike enormous gipsy caravans"||—were not run by the proprietors themselves, who could only make a charge according to the weight of the passengers, so many being estimated to the ton.¶

* *Durham County Gazette*, 1st October, 1825. † *Life of Richard Trevithick*, vol. i. p. 161.

‡ Brewster's *Edinburgh Encyclopædia*, article "Railroads," by Robert Stevenson, C.E.

§ "In so far as the Reporter knows, a regular system of travelling on Railways, or the conveyance of passengers, has not been attempted, *excepting perhaps from Kilmarnock to Troon in Ayrshire*." Robert Stevenson's *Report on the Midlothian Railway*, 1818, p. 38.

|| "J'ai vu des diligences établies sur la route en fer de Kilmarnock à Troon Bay; elles donnent l'idée d'une voiture nomade enorme, et, pourtant, trainée sans effort par un seul cheval." *Relation succincte d'un second voyage fait en 1817 and 1818 dans les ports d'Angleterre, d'Ecosse et d'Irlande*, 1818, p. 77. These "diligences" were no doubt the yellow-painted vans or carriages called "Caledonas," with seats all round them for passengers, some with seats on the top, which are stated to have been running on the line early in the thirties of last century.

¶ *Second Report on Railways*, 1839, p. 392.

A carriage "with receptacles expressly made for passengers, elegantly constructed in the barouche style,"* had been used at the opening of the Patent Suspension Railway, at Cheshunt, in Hertfordshire, on 25th June, 1825, and a point advanced at the time in favour of the mono-rail system was its "admirable application for the conveyance of persons as well as goods;"† but these experiments, anticipatory as they were of a great new system of conveyance, were on too small a scale to attract general attention, even if the results had been more strikingly successful. Not from Merthyr Tydvil, Swansea, Kilmarnock or Cheshunt, but from Darlington came the dynamic impulse of the movement which has covered the world with railways.



VIGNETTE ON SHARE CERTIFICATE, 1823.

* *Register of the Arts and Sciences*, 1825, vol. ii., p. 354.

† *Ibid.*, p. 355.

CHAPTER IV.

THE RAILWAY IN OPERATION.

[1825-1828.]

After the remarkable demonstration of the 27th of September, 1825, so far-reaching in its effects, South Durham became, in the words of Henry Booth, "the great theatre of *practical* operations on railways."* In making arrangements for working the line the committee of management felt "the novelty of their situation as the directors of a concern in which they had not the advantage of a single example."† Their difficulties were increased by the unfinished state of the works. The rails had yet to be laid to Witton Park Colliery, siding and warehouse accommodation provided at various places, and shipping staiths constructed at Stockton, before the Company could accept all the traffic which was ready to come upon the line.‡

The staff, like the directors, lacked experience in the working of railways. Richard Otley, the secretary, had been a land surveyor and, in this capacity, had assisted in the first surveys of the line; Thomas Storey, the engineer and general traffic manager, had been a colliery viewer; and Timothy Hackworth, the locomotive superintendent, "foreman of the smiths," at Wylam and Walbottle Collieries. Men had to be drawn from other walks of life to manage the first of the modern railways. Various, too, had been the occupations followed by those who filled the minor positions on the railway, and by the unsuccessful candidates for them. Among the applicants for the post of weighing machine keeper was a village pedagogue, who had "*tached* a school upwards of twenty-five years,"§—apparently with some success, for he was a shareholder of the Company—and desired a more "airy situation."

* *Account of the Liverpool and Manchester Railway*, 1831, p. 69.

† Report of the committee to a general meeting held 10th July, 1827.

‡ Sub-committee minutes, 30th September, 7th and 14th October, 1825.

§ Application dated 26th September, 1825. N.E.R. Muniments.

Instead of keeping the carrying trade in their own hands, the Company decided to let the conveyance of coals to contractors. George Stephenson and Nicholas Wood were early in the field with a proposal,* but the negotiations did not ripen into an agreement. Meanwhile, the directors made a temporary arrangement with George Bell, of Aycliffe, to lead the coals from the bottom of the Brusselton east inclined plane to Stockton at 1s. 3d. per ton, to Yarm at 1s. 1½d. per ton and to Darlington at 6d. per ton, the greasing of the waggons being included in these prices;† and also with George Stephenson (not the engineer) to lead coals across St. Helen's Auckland flat at 4s. 10d. for 80 tons.‡

The carriage of coals for landsale was the traffic on which the Company mainly relied for their revenue, and it was in connection with this traffic that the railway was first used. Extensive depôts, which stand out so prominently in the well-known lithographic view of the opening, had been erected at Darlington, on the west side of the Great North Road, near the Northgate Bridge. These were brick-arched cells, each thirty feet long, eighteen feet wide and thirteen feet high.§ Others, not so open to objection as the Darlington cells on the score of height, had been built, and were in course of erection, at Stockton. Soon after the opening of the railway, the price of coals at Stockton fell from 18s. to 12s.,|| dropping afterwards down to 8s. 6d.¶

The first coals for Yarm passed along the railway on the 11th of October, 1825. On the 17th, the depôts at that place were opened to the public. The event was celebrated, and the New Inn at the termination of the branch formally opened, by the leading tradesmen of the town in the evening of this day, when the principal toast proposed was "The gentlemen of Yarm," "with whom," as the *Durham Chronicle* observed, "the idea of this great undertaking originated, and to whose perseverance, in an early stage of the work, the public are so much indebted for its completion."***

The collieries from which the Stockton and Darlington Railway Company derived their early mineral traffic were:—Old Etherley, New Etherley or West Auckland, Witton Park, Eldon and Black Boy; the coals from the two last-named collieries having to be carted for a distance of from two

* Nicholas Wood to the committee, 3rd October, and to Edward Pease, 10th October, 1825.

† Sub-committee minutes, 7th October, 1825.

‡ *Ibid.*

§ Walker and Burges's report to directors of Leeds and Selby Railway, 27th September, 1832.

|| *Leeds Mercury*, 26th November, 1825.

¶ *Ibid.*, 6th January, 1827.

** *Durham Chronicle*, 22nd October, 1825.

to three miles to Thickley Spout. The moderately round and small coals which the Company required for their own use, they obtained from the Old and New Etherley Collieries, paying 3s. 9d. a ton for the one kind, and 2s. a ton for the other.*

The Company's operations were considerably restricted at first owing to the deficiency of hauling power. Shortly after the opening, "Locomotion" broke a wheel: another set of wheels had to be cast by the Bedlington Iron Company, and it was not until the 12th or 13th of October that the engine was ready to start again. Then a delay took place in the delivery of the second engine, the "Hope," which did not leave Newcastle until the 1st of November. When it arrived at Shildon, this engine was found to be in such a very imperfect state that the smiths were employed upon it a whole week before it could be got to work.† The frequent breaking of various parts of the engines, especially of the cast iron wheels, reduced their effective power, and engines, which were calculated to make two journeys in one day, were scarcely able, it was said, to make one journey in two days.‡

Two more engines had been ordered from Messrs. R. Stephenson and Company, and yet another was urgently wanted. The directors had applied to Messrs. Fenton and Murray, of Leeds, for whose engines on the Blenkinsop principle, it was claimed in 1822, that they had not been surpassed for "neatness, execution, and efficiency,"§ but without success. This firm was not prepared to manufacture locomotive engines until they had become a regular article of sale. Matthew Murray, however, recommended, and described to George Stephenson, a type of locomotive engine which anticipated by twelve years the "Hurricane" and "Thunderer" of the Great Western Railway. His suggestion was "to leave the engine upon one carriage with four wheels, and the boiler upon another carriage, each spring-mounted, connected together by a jointed steam-pipe."|| This construction, he thought "would reduce the great evil, viz., the weight of the engine, one-half, and would be a great saving of the rails."¶

An engine with four cylinders, which seems to have been built to run on a railway three-quarters of an inch wider than the Stockton and Darlington Railway, was eventually offered to the Company by Mr. Robert Wilson, of Forth Street, Newcastle, for £380. It was taken on trial for a

* Sub-committee minutes, 7th October, 1825.

† *Ibid.*, 11th November, 1825.

‡ Glasgow paper quoted in *Liverpool Mercury* of 9th December, 1825.

§ *Newcastle Magazine*, October, 1822, p. 545.

|| Fenton and Murray to Richard Otley, 26th October, 1825. N.E.R. Muniments.

¶ *Ibid.*

month and began working in December, during which month it led $18\frac{1}{4}$ tons of coal to Darlington, $23\frac{1}{4}$ tons to Yarm, and 50 tons to Stockton. By the railway men, it was called the "Chittaprat"* a name descriptive of the peculiar noise (due to the formation of the cylinders) which was made by the steam when it left the chimney.† It is an important link in the history of steam locomotion, being the first engine "in which a single pair of wheels was worked by two pistons acting upon cranks at right angles to each other."‡ It was not, however, of much use to the Company, for, during the first three months of 1826 it only hauled $1,003\frac{1}{4}$ tons, viz., 303 tons to Darlington, $2\frac{1}{4}$ tons to Urray Nook, $247\frac{3}{4}$ tons to Yarm and $450\frac{1}{4}$ tons to Stockton, Mr. Wilson being paid for leading by the engine at the rate of fourpence a ton to Darlington, eightpence to Urray Nook, ninepence to Yarm, and tenpence to Stockton.

When it is considered how much inconvenience must have resulted from the temporary withdrawal of one of these engines from active service, it is not, perhaps, surprising to find among the early accounts of the Quaker Company, under the head of "Contingent Expenses," an item of 16s. 9d. "for men's allowance in ale to stimulate them to greater exertion, while repairing the engine."§

To the difficulties arising from an insufficiency of engine power were added others attributable to a deficiency of waggons. The waggons were frequently detained at Yarm, where there was no apparatus at this time for discharging them, and at other places on the line, so that the cry from the collieries for "empties" was heard at a very early stage in the working of the railway.

Still, in spite of these impediments, the Company were able to carry 10,000 tons of coal during the first three months, receiving in the form of dues nearly £2,000.

Aware of the prejudices which existed against the railway, the directors had prudently decided to keep down the rates until the whole of the traffic of the district had been brought on to the line.|| The charge for conveying a ton of coals was $1\frac{1}{2}$ d. per mile, which included haulage and the use of waggons, and, in addition, a shilling per ton on the Witton Park and Old Etherley coals and sixpence per ton on New Etherley coals for incline dues.

* "The First Engine-drivers," *Newcastle Weekly Chronicle*, 2nd October, 1857.

† *Ex inf.* Mr. John Kitching.

‡ Zerah Colburn, *Locomotive Engineering*, 1871, p. 21.

§ General Pay Bill, August, 1826.

|| Joseph Pease to Edward Pease, 30th May, 1826. Railway Collection, Newcastle Public Library.

This comparatively moderate charge did not, however, overcome the prejudices referred to, for, seven months after the opening of the line, many of the farmers of the district were leading their coals twenty miles and upwards by their own teams rather than make use of the railway.*

It has already been shown (p. 64) how the founders of the Stockton and Darlington Railway, doubting the possibility of an export trade, had accepted the terms of the promoters of a competing line, and agreed to limit their toll upon coals for exportation to a halfpenny per ton per mile. A clause making this restriction compulsory had been inserted in their bill of 1821, when in a committee of the House of Commons,† at the instance, it is said, of Mr. Lambton, whose object in fixing what he believed to be an unremunerative maximum toll was to shut out the South Durham coals from the London market and protect the Wear from the competition of the Tees. Yet, just before the opening of the railway, some London house appears to have been negotiating with the collieries for a supply of 100,000 tons of coal annually, and the directors realised at the last moment that, even with their low charging powers, there was a possibility of their being able to carry coals for exportation. The chairman, on the 27th of September, 1825, considered an export trade as *certain*.‡ Mr. Mewburn, more cautious, made an entry in his diary that an export trade was to be attempted.§

At this time, however, the Company were unprepared for the new traffic. The coal-shipping staith, for which a design had been passed on the 12th of August, was unfinished; the waggons were not suitable, falling short of the statutory capacity by thirteen hundredweights, many of them having end, instead of bottom, boards, and these being, according to Mr. Storey, the resident engineer, "nearly all as bad a set of waggons as were ever turned out on a railway."||

Within three days of the opening the directors were considering the best means of providing for the expected traffic. They thought at first of adopting a plan which had been in use on the Wear for seven years, that of carrying the coals in boxes, these to contain, not a Newcastle but a London chaldron (36 Winchester bushels), and George Stephenson was instructed to furnish the requisite dimensions.¶ It was ultimately found

* Joseph Pease to Edward Pease, 30th May, 1826. Railway Collection, Newcastle Public Library.

† Minutes of evidence on the Stockton and Darlington Railway Bill, 1828, p. 18.

‡ Chairman's account of the opening. § *Larchfield Diary*, p. 12.

|| Thomas Storey to Richard Otley, 21st October, 1825. N.E.R. Muniments.

¶ Minutes of committee meeting, 30th September, 1825.

preferable to alter all their waggons so that they might open at the bottom, and to increase the capacity of a number of them up to fifty-three hundred-weights by the addition of side boards. On the 14th of October it was decided to raise the platform of the staith four feet higher than was originally intended, and Mr. Storey was instructed "to proceed in the completion of the same with all possible despatch."*

It was not until January, 1826, that the first staith was completed: it was merely a jetty of fir piles covered with planks, over which the rails were laid. The ship being moored alongside, a movable platform, hung upon hinges, was lowered to a horizontal position and the waggon run out upon it immediately over the hold.† On the 24th of this month the Tees Coal Company began loading the ship "Adamant" at the newly-erected staith with coals from Old Etherley Colliery—coals which had been in the pit at four o'clock on the previous afternoon.‡ On the 26th the vessel, with a cargo of 168 tons, was towed out of the river by the steam-tug "Albion," accompanied by a band of music and cheered on its course by the crowds gathered on the wharves and quays. Within a few months it was found necessary to erect a second staith between the north end of Cottage Row, where the first one stood, and Fawell's Buildings; a third was built opposite to these buildings, near Walker's Mill, in the spring of 1827, and a fourth, south of the first, opposite to Cottage Row, in the autumn of this year.

All the goods that passed along the line during the first three months (a few colliery stores, oil, wood, iron goods, etc.), were carried by the Company themselves, sometimes in the returning coal waggons, without way-bill or consignment-note of any kind.§ The receipts under this head only amounted to £22 11s. 11d., and on the 30th of December it was decided to give up the transport of merchandise and to throw open the line to the public, the waggons previously used for this purpose being divided between Longstaff and Howgill, the Stockton carriers, who were to pay a halfpenny per ton per mile for the use of them||—a charge shortly afterwards remitted altogether. The change was an advantageous one, for the receipts during the next three months were £150 4s. 6d., which included £51 for the carriage of lead from the Durham Road, near Darlington, to Stockton—a new and promising source of revenue.

* Sub-committee minutes, 14th October, 1825.

† Walker and Burges's report to directors of Leeds and Selby Railway, 27th September, 1832.

‡ *Local Records of South Durham*, 1819-1827, p. 75.

§ Thomas Storey to Richard Otley, 28th November, 1825.

|| Sub-committee minutes, 30th December, 1825.

Until the end of March and beginning of April, 1826, when four new kilns were lighted at East Thickley, the carriage of lime added little to the Company's revenue, the amount received for the six months ending 31st March, 1826, being only £46. It was in connection with this branch of industry that the Company first adopted the plan of fostering traffic by reducing rates. On the 7th of July, 1826, it was resolved that, for the purpose of encouraging the sale of lime upon the railway, coals brought down for the purpose of burning lime should be charged at the rate of threepence per ton for passing each inclined plane, instead of sixpence as heretofore.

In 1822, after the works had commenced, the founders of the Stockton and Darlington Railway discovered that the railway was suitable for the conveyance of passengers as well as of goods, and they got power in their second Act to take tolls for coaches and other carriages which might travel along the line with passengers, and even to use locomotive engines in the haulage of these vehicles. They were no doubt looking a long way ahead, for, at that time, there was little prospect of much revenue from this branch of traffic, when one coach running between Stockton and Darlington three times a week* afforded facilities, more than ample, for communication between the two towns. The coach, which was built to convey the proprietors on the opening day, was "intended to travel daily for the public accommodation between Darlington and Stockton."† The directors, however, appear to have overlooked the fact that, before the coach could begin to run, it would be necessary to obtain a license and to execute a bond, the charges for which would amount to £2 11s. 6d. By Act 3 George iv., cap. 95, there was a duty of one penny per mile for any vehicle with two or more wheels and drawn by *one* horse only, such vehicle not having the aid or assistance of any spring or springs.‡ On the 7th of October the directors decided to apply for a licence, and, on the 10th, the coach service between Darlington and Stockton was started. An arrangement was made on the 14th with Thomas Close to run the coach for £2 2s. a week, the Company advancing him £25 to buy a horse and harness, which sum he was to repay by instalments.§

As it was considered necessary to intimate to him that the first time he should be seen intoxicated he would be dismissed, and the sum due to

* *Tyne Mercury*, 16th January, 1827.

† *Durham County Advertiser*, 1st October, 1825.

‡ *The Statutes of the United Kingdom of Great Britain and Ireland*, vol. viii., p. 892.

§ Sub-committee minutes, 14th October, 1825.

him as wages forfeited, it is significant that, on the 25th of the following month, Richard Otley should have been instructed to contract with Richard Pickersgill, one of the principal carriers by road in the North of England, for horsing the coach for three months from that time.* Close, however, seems to have been retained in his service as the driver of the coach.

From the first railway time-table, which has been often reprinted, it appears that two hours were allowed for the journey between the respective depôts of Stockton and Darlington, a distance of nearly twelve miles. On the Mondays the coach set off from Stockton at half-past seven o'clock in the morning and from Darlington, on its return journey, at three in the afternoon. On Tuesdays it left Stockton at three in the afternoon and remained at Darlington all night. On Wednesdays it started for Stockton at half-past seven in the morning, and left that town again at three in the afternoon. Similar journeys were run on the Thursdays and Fridays. On Saturdays the coach left Darlington at one in the afternoon and remained at Stockton over the Sundays.† The coach duty, which amounted to 9s. 2d. per week, was calculated on 110 miles, though the distance actually run was about 120 miles. The fare from one town to the other was 1s. or 1d. per mile, the rate thus fortuitously adopted being the same, it will be noticed, as that on which a very large percentage of the single fares in the United Kingdom are based at the present day. Passengers were allowed to take a package—a more comprehensive term than luggage—not exceeding fourteen pounds in weight. Extra weight was charged for at the rate of twopence per stone. Small parcels were carried for threepence each. There was no station or waiting-room on the line, only a starting-point, an occasional stopping-place, and a terminus. Richard Pickersgill, at his office in Commercial Street, Darlington, and Mr. Tully, at Stockton, received parcels and booked passengers.

The receipts from passengers and parcels from the 10th of October to the 31st of December amounted to £86 4s., not a great sum indeed, yet it was £35 more than that which had been received for the carriage of lime, lead, timber, merchandise, etc., and, moreover, it disclosed a profitable source of revenue from which even greater results might be anticipated.

But the Company were no more desirous of becoming the carriers of people than of goods, and, in February, proposals were invited for the taking of the coach and the working of the passenger traffic on the line.

* Sub-committee minutes, 25th November, 1825.

† Copy of time-table in *Jeans' Jubilee Memorial*, p. 81.

Offers were received ranging from £140 to £180 a year, the latter submitted by Thomas Close "driver of the 'Experiment Coach.'"* Eventually, on the 17th of March, the coach, having had sixteen new mahogany panels put into it,† was let to Richard Pickersgill, who took over the conveyance of passengers from the Company for £200 a year from the 1st of April, 1826.‡ By this time some improvements had been made in the service. The journey between the two towns was performed in an hour and a quarter, and there was an outside fare of ninepence.§ What provision was made at first for outside passengers we do not know. By the 4th of April it had evidently been found necessary to increase the accommodation, for, on that date, a new double seat, to hold twelve passengers, was fixed on the coach top by Ralph Smith, of Darlington, the top side rails being also altered and strengthened.|| As many as 158 passengers are recorded to have been carried by the coach in one day.¶

Early in April, the *Durham County Advertiser* announced that a new coach, the "Express," had been started by the Railway Company, "more comfortably fitted up than the former one, being lined with cloth," etc. Both coaches, it was stated, had been taken from the Company at a given sum by Richard Pickersgill.** Though the sub-committee had instructed Richard Otley, on the 11th of November, 1825, to apply to the various coach makers in Darlington for a sketch or pattern of a coach to run on the railway, there is no evidence that an order was given for it, and as one coach only was let to Richard Pickersgill, the "Express" coach, in all probability, was Pickersgill's own. A florid advertisement, issued by Pickersgill soon after completing his agreement with the Company, announced:—"Unparalleled cheapness, safety and expedition in travelling by the 'Experiment' and 'Express' coaches on the Stockton and Darlington Railway."††

The facilities of intercourse between Darlington and Stockton were now doubled, the coaches leaving the former town at 8.30 a.m. and 5.30 p.m., and the latter town at 8.0 a.m. and 4.30 p.m. Two classes were practically introduced. The inside fare by the more comfortable coach was 1s. 6d.

* Sundry proposals for taking the coach, 15th and 17th February, 1826. N.E.R. Muniments.

† Ralph Smith's account, March and April, 1826. N.E.R. Muniments.

‡ Sub-committee minutes, 17th March, 1826. § *Liverpool Mercury*, 31st March, 1826.

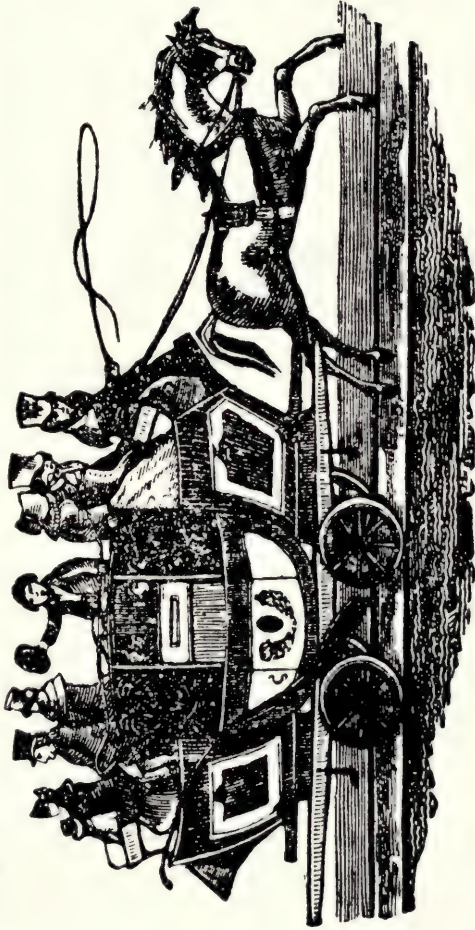
|| Ralph Smith's account, March and April, 1826. N.E.R. Muniments.

¶ *Durham County Advertiser*, 8th April, 1826.

** *Ibid.*

†† Richmond's *Records of Stockton*, p. 148.

RAPID, SAFE, AND CHEAP TRAVELLING
By the Elegant NEW RAILWAY COACH,



THE UNION,

Which will COMMENCE RUNNING on the STOCKTON and DARLINGTON RAILWAY, on MONDAY the 16th day of October, 1826,

And will call at Yarm, and pass within a mile of Middleton Spa, on its way from Stockton to Darlington, and vice versa.

FARES. Inside 1½d.—Outside, 1d. per Mile. Parcels in proportion.

No gratuities expected by the Guard or Coachman.

N.B. The Proprietors will not be accountable for any Parcel of more than £5. value, unless entered and paid for accordingly. The UNION will run from the Black Lion Hotel and New Inn, Stockton, to the New Inn, Yarm, and to the Black Swan Inn, near the Croft Branch, Darlington; at each of which Inns passengers and parcels are booked, and the times of starting may be ascertained, as also at the Union Inn, Yarm, and Talbot Inn, Darlington.

On the 19th and 20th of October, the Fair Days at Yarm, the Union will leave Darlington at six in the morning for Yarm, and will leave Yarm for Darlington again at six in the evening; in the intermediate time, each day, it will ply constantly between Stockton and Yarm, leaving each place every half hour.

(From the *Durham County Advertiser*, 14th October, 1826.)

and the outside fare the same as the inside fare of the "Experiment," "without any charge for guards or coachmen"—an important consideration when it is remembered that the fees to those individuals between Newcastle and London amounted to 17s.* Small parcels were classified as parcels not exceeding fourteen pounds, and parcels above that weight and not exceeding twenty-eight pounds, the former being carried for twopence each, the latter for threepence.

The man who had acted as clerk at Stockton was removed into the weigh house then stated to be ready, and the cottage used as an office on the Quay was let to Pickersgill.

Some innkeepers at Darlington and Stockton now gave notice of their intention to run coaches in opposition to Pickersgill, and on the 20th of May, 1826, the directors found it necessary to cancel the agreement which reserved the license for vehicles of this description to one individual† on the following conditions:—

"That in future, until further ordered by a general meeting, the tolls upon all carriages conveying passengers be charged at the rate of threepence per mile for every coach or other carriage, the same allowance of weight in parcels as named in the aforesaid agreement being continued, and that Pickersgill should have the sole use and privilege of employing the Company's coach called the 'Experiment' for twelve calendar months from the date of his former contract, the Company to give him upon the settlement of his May account the sum of £5 over and above all profits received by him up to that date, as a consideration for rescinding the agreement."‡

Bye-laws were passed on the 2nd of June "for the better ordering of conveyances for passengers," and it was decided that, from that time forward, every driver would be expected to deliver at the Company's cottage, Durham Lane (east of the present North Road Station), or at the weigh house at Stockton§ a ticket giving the name of the coach, the place to which it was going and other particulars. In July, Martha Howson, of the Black Lion Inn, Stockton, and Richard Scott, of the King's Head Inn, Darlington, placed two new coaches on the line—the "Defence" and the "Defiance," and, on the 16th of October, the "elegant new railway coach, the 'Union,'"

* *Life of Thomas Sopwith*, 1891, pp. 56 and 57.

† Letter from Joseph Pease to Edward Pease, 30th May, 1826. Railway Collection, Newcastle Public Library.

‡ Sub-committee minutes, 20th May, 1826.

§ *Ibid.*, 2nd June, 1826.

began running between Yarm and Darlington and Yarm and Stockton, the starting-points being the New Inn at the end of the Yarm Branch, the Black Swan Inn at Parkgate, Darlington, near the Croft Branch, the Black Lion Inn, Stockton, as well as the Railway Tavern, which the Company were then building near the depôts.

To an intelligent practical engineer, who visited the line in September with a friend of the same profession, we are indebted for an admirable account of this early mode of railway travelling.* At the time of their visit the "Express" was running once a day from Darlington to New Sildon and back, the "Defence" and "Defiance" were plying between Darlington and Stockton, each twice a day.

Leaving Darlington at 8:14 a.m., by the "Defence," which set off with thirteen outside and two or three inside passengers, several others being taken up on the way, they arrived at Stockton at 9:35 a.m., making the journey of twelve miles in one hour and twenty-one minutes, including eleven minutes for stoppages. The average speed was ten miles an hour, but on certain portions of the line the coach travelled at the rate of fourteen miles an hour. The coach by which these engineers returned to Darlington left Stockton at 1:12 p.m. with fifteen outside and two or three inside passengers and arrived at its destination at 2:25 p.m., the rate of speed being the same as on the down journey, though the gradients were against the coach. Each coach was drawn by a single horse, which made a double journey per day, yet running at such a speed, with such a load, it appeared to make scarcely any exertion, certainly not so much as a horse in a gig. Only occasionally did it give the vehicle a pull; at other times, even in ascending from Stockton to Darlington, the traces seemed to hang quite loose, and by far the greatest exertion of the horse appeared to consist in keeping up its own motion.

The number of passengers which the coaches were constructed to carry was six inside and from fifteen to twenty outside, but at times this number was greatly exceeded. For instance, on one of the days of the Stockton Races (17th, 18th, and 19th of August, 1826), the "Defence" took up from Stockton nine inside and thirty-seven outside passengers, in all forty-six. "Of these, some were seated round the top of the coach on the outside, others stood crowded together in a mass on the top, and the remainder clung to any part where they could get a footing." On this occasion two

* *Caledonian Mercury*, 14th October, 1826.

horses were used. If the same regulations applied to the railway, as to the road coaches, the driver of the "Defence" had reason to congratulate himself that they were not enforced in the Stockton district with the same stringency as in the Newcastle district, where the driver of "the Tynemouth and Newcastle stage coach called the 'Northumberland,'" for carrying but one outside passenger more than he was authorised to carry by his license, was adjudged to pay a mitigated fine of £5 and costs.*

The coaches had no springs of any kind, and yet the motion, we are told, was fully as easy as in any coach on the turnpike road. A very slight jolt was felt, accompanied by a click or rattle, every time the wheels passed over the joints of the several rails or the points leading into a siding. The travellers noticed the difference of motion and of feeling when the coach was running over the short cast-iron rails on the line. The jerks and jolts, in passing over the joints of the rails, were more frequent, more audible, and more sensible, resembling exactly, as the driver justly observed, the clinking of a mill hopper.

A noticeable feature of the coach was the powerful brake at the side. The long arm or lever reached up to the coachman's box, resting, when not in operation, on a hook under his seat. To check the motion of the vehicle or stop it altogether he released the lever, and, setting his foot on the end of it, pressed the brake-block against the wheels and obtained complete command both of the coach and the horse, however rapidly these might be moving. At every bend of the road, and at every point where the view was obstructed, the coachman blew a horn to give warning of his approach to the drivers of any waggons or carriages which might be coming or going on the line.

"The circumstances of bustle and activity along the line with the coming and returning of the passengers" afforded evidence of the success of this "first great attempt to establish the use of railways for the general purposes of travelling,"† which surprised alike the Company and the public. Within fifteen months from the opening day as many as seven coaches were running on the railway between Stockton and Darlington.‡

To induce the proprietors of coaches to run beyond Darlington to Brusselton, the Company reduced their tolls on this part of the line from threepence to twopence per mile in October, 1826, and from twopence to one penny the following month.§ In January, 1827, the development of the new traffic

* *Durham County Advertiser*, 6th October, 1827.

† *Caledonian Mercury*, 14th October, 1826.

‡ *Tyne Mercury*, 16th January, 1827.

§ Sub-committee minutes, 13th October and 11th November, 1826.

was seriously imperilled. On the 18th of that month we find Edward Pease writing to Joseph Sandars, of Liverpool:—"Our railway coach proprietors have individually received notice of a process in the Exchequer for various fines to the amount of £150 in penalties of £20 each, for neglecting to have the plates, with the numbers of their licenses on the coach doors, agreeably to the provisions of the Act iii., George IV., Cap. 95. In looking into the nature of this proceeding and its consequences, it is clear if the Court shall confirm it by conviction that we are undone as to the conveyance of passengers."

The proceeding was eventually defeated, it being decided that the penalties applied only to coaches travelling on common or turnpike roads.*

The "Experiment" appears to have been driven off the lower part of the line by the lighter and more comfortable coaches of the Darlington, Stockton and Yarm innkeepers, and was employed between Darlington and Brusselton until November, 1827, when a new coach began to run on this part of the line, the "Perseverance," started by Dan Adamson, of the Grey Horse (now the Surtees Arms), Shildon Lodge, whose youngest son, at this time nine years of age, was to become famous as the founder of the great engineering works at Hyde Junction, Dukinfield, and the chief promoter of the Manchester Ship Canal.

The old coach, so it is stated, was then removed to the foot of Brusselton Bank, and made into a cabin, presumably in December, 1827, as a cabin was required there at that time for the use of the bankrider and sheave-oilers.† Not long afterwards two enginemen who were spending the night in the cabin accidentally set it on fire,‡ and this was the end of the Company's coach called the "Experiment."§ The occurrence must have taken place previous to the

* Smiles' *Lives of the Engineers*, vol. iii. p. 172.

† Timothy Hackworth to Edward Pease, 7th December, 1827.

‡ Speech at Shildon by John Wesley Hackworth, 9th November, 1875. *Darlington and Richmond Herald*, 13th November, 1875.

§ On the 29th of September, 1827, there were running in the county of Durham two railway carriages which, if they could have been preserved, would have been of the greatest interest at the present day. One was the "Experiment," so soon to be transformed into a cabin. The other was the "Royal George," specially built to convey the Duke of Wellington on this particular day from North Pittington Colliery to Penshaw along the Londonderry waggonway, a line now abandoned, which the passenger from Durham (Elvet) to Sunderland crosses a little beyond Pittington Station. This car—a landau on railway wheels—was the first spring mounted vehicle which ever ran upon a railway. It was elaborately painted; the panels of the body, according to a coloured drawing still in existence, being olive green with borders of dark green, the sole-bars and buffers amber, the wheels and axles red or purple, the springs crimson, and the coupling chains dark blue.

1st of July, 1828, for on that day one of the men, John Cree, was killed on the line.

As Messrs. Walker and Rastrick, during their visit to the Stockton and Darlington Railway in January, 1829, "were favoured with the use of the Company's coach,"* it is evident that the Company had found a substitute, for the "Experiment." This was no doubt the "Eclipse" post coach, altered by Ralph Smith, of Darlington, in August, 1828, to run on the railway.

The coaches set out from different places on the Quay at Stockton—the "Express" and the "Defence" from the Bay Horse at the foot of Castlegate, the "Defiance" from the Black Lion yard, and the "Union" at first from the Black Lion Hotel and afterwards from the Custom House Tavern at the foot of Finkle Street.† At Darlington, the starting point was near the North Road crossing. Previous to November, 1827, no particular place on the line here was assigned to the respective coaches, and there were frequent disputes between the drivers for precedence. In consequence of these altercations, it was decided on the 9th of this month "that Longstaff and Company's coach be stationed for the ensuing month on the south side of the railway at Durham Lane, and Scott and Company's on the short siding nearest the present shed." R. Peacock, "the overlooker of the railway," as he is called in the directory, received orders to remove any coach placed in violation of this order.‡

They were stubborn and quarrelsome these old drivers, and they held bye-laws and regulations in light esteem when their blood was up. The story is told§ of two coaches which happened to meet on the line midway between two sidings. It was necessary for one of them to go back to allow the other to pass, but neither of the drivers would give way. Both were prepared to remain till Doomsday rather than do so, and, in this resolution, they were backed up by the passengers in their respective coaches. It was an awkward dilemma. Fortunately, one of the drivers found a way out of the difficulty without loss of honour. With the aid of his passengers he lifted the coach bodily off the rails, restoring it to the same position after the other coach had run past. Both coaches went ahead and there was no broken vow.

* Rastrick's Report to the Directors of the Liverpool and Manchester Railway, p. 45.

† *Parson and White's Directory*, 1828, vol. ii. p. 320.

‡ Sub-committee minutes, 9th November, 1827.

§ James Clephan, *The Canal and the Railroad*, 1875, p. 44. The incident was related to Mr. Clephan by a friend who had been a passenger in one of the coaches.

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PLATE VII.



Thomas Allom.

View of Stockton, showing Railway Coach on the Quayside Line.

W. Floyd.

It is evident when incidents like this could occur how difficult it must have been to work the traffic on a single line, even with four passing places to a mile. An order of precedence soon came to be recognised, and this was established by regulations for taking the sidings. Locomotive engines had the first claim on the road, and all horse-drawn carriages and waggons had to make way for them. On the approach of a locomotive engine ascending with a train of loaded waggons, an engine descending with a similar train was required to give way, but if they met between passing places it was the duty of the ascending engine to put back into the next siding down the way.

A locomotive engine drawing empty waggons always gave way to one hauling loaded waggons. Loaded waggons, drawn by horses, had the next claim on the road, a coach even having to turn out of the main way at their approach. While the coach had to take the siding on the approach of a locomotive engine or a set of loaded waggons, these were required, on being overtaken by a coach, to stop at the first siding they came to past the switches and allow the coach to pass into this siding and out at the other end, and so run ahead of them. When a coach was coming towards them they had to stop at the siding immediately preceding that which the coach might be passing or have just left behind, to avoid interfering with its progress.

It was difficult to enforce the observance of these rules of the road, and the directors had many cases before them like that of John Coates, waggon driver of George Longstaff, the carrier, who would not take the siding on the approach of Richard Scott's coach on the 10th of October, 1826, and was therefore called upon to pay a fine of five shillings.*

The various coaches which came on to the line under the new arrangement ran during the first year (July 1st, 1826 to June 30th, 1827) 45,460 miles, and carried between 30,000 and 40,000 passengers. The Company received in tolls the sum of £563, being paid for the use of their railway at the rate of threepence per mile for week-day trips, and sixpence per mile for Sunday trips, of which a few were run during the summer months.

The Company's outgoings, in connection with the whole of the passenger and goods traffic and a great portion of the mineral traffic, were almost entirely for the maintenance of the way and general superintendence. Though the line was a new one the expenditure under the head of maintenance of way was by no means inconsiderable. The malleable iron rails

* Sub-committee minutes, 13th October, 1826.

being light and the cast iron rails brittle, frequent breakages took place. Then the embankments showed signs of instability. The most troublesome of these was one about 240 yards in length, between Darlington and Heighington, laid upon a bog at Myers Flat. James Potts and his gang of workmen finished their contract on this part of the line on the 11th of June, 1825; and, though the embankment appeared firm enough, it began gradually to subside, and continued to do so for many years. Mr. Storey, giving evidence in 1829, declared that it was even then sinking as much as the very first year it was made. Upwards of £300 had been spent the previous year in leading materials to keep up the embankment, and from four to six men had been employed during the winter to keep the rails in order. The whole traffic of the line was sometimes stopped until this short embankment had been put right.*

Most of the work on the line—the haulage by the locomotive and stationary engines, the leading by horses across St. Helen's Auckland flat, and the repairing of the way, was done by contract. The enginemen were at first paid fixed wages, 3s. 8d. a day, but, on the 17th of February, 1826, the Company made an arrangement with them whereby they took over the motive power, and agreed to haul the coals at so much per ton. The locomotive enginemen, James Stephenson and Robert Morrow, for a farthing per ton per mile, and the men in charge of the Brusselton and Etherley engines, William Mowtrey and Thomas Greener, for 1¼d. and 1½d. per ton respectively, undertook, not only to draw the loaded waggons and haul back the empty ones, but to oil the bearings of the waggon wheels, paying their assistants' and firemen's wages, and finding their own coals, tallow, oil, hemp, etc.† That the enginemen did not study economy in the use of fuel and stores when these were supplied by the Company may be taken for granted. Under the new arrangement they did not always scruple, when short of fuel, to supply themselves from the loaded waggons. One of the locomotive enginemen was observed from the turnpike road doing this, and, on being taken to task about it by the eye-witness, replied "that he borrowed and lent." There was proof positive of his borrowing, but, of his lending, the indignant coal merchant had none, and, to him, the arrangement appeared as "a bait to make an honest man a rogue."‡

* Thomas Storey's evidence, Clarence Railway Bill, 1829, p. 148.

† Sub-committee minutes, 17th February, 1826.

‡ Jeremiah Cairns to Richard Otley, 5th May, 1827. N.E.R. Muniments,

The arrangement turned out well for the contractors; and the sub-committee, finding that Mowtrey and Greener in particular were making more than fair wages, decided, on the 18th of August, to revert to the former plan, paying the enginemen 22s. and their assistants 18s. a week, with a stipulation that, when not attending to the engines, etc., they were to be employed on other work for the Company. Thomas Storey and Timothy Hackworth were requested to endeavour to find suitable work for them.*

For two months the fixed engines were worked on these terms, and then the Company made another contract with the men, this time at 1½d. per ton in both cases.† The price per ton for the Etherley engine was reduced in July, 1827, to a penny,‡ and, in June, 1828, the riding of the banks at Brusselton and the greasing of the sheaves were let to Ralph Stephenson at threepence per set of twenty tons, and Mowtrey's rate of remuneration was reduced to a shilling per set, 18 sets per day being guaranteed to him.

In July, 1827, the renewal of the grate-bars was included in the contract of the locomotive enginemen, who agreed to allow fourpence per trip to Darlington, sixpence per trip to Yarm, and eightpence per trip to Stockton when the Company found the bars.§

The leading of coals by horses across the flat at St. Helen's Auckland, was let on the 24th of February, 1826, at a halfpenny per ton, and advanced on the 15th of December to a shilling per set of twenty tons.|| In April, 1828, the directors contracted with Thomas Pearse for this work at 9d. per set for Etherley, and 11d. per set for West Auckland waggons; he engaging to begin leading at 5 o'clock a.m., and work until 8 o'clock p.m., when required, or even longer in case of any great demand for coals.¶ For leading eastward of Brusselton the price paid in 1826 was a halfpenny per ton per mile, which was slightly increased in 1827, fivepence being paid to Darlington (8½ miles), tenpence to Yarm (17½ miles), and one shilling to Stockton (20 miles). The price to Yarm was reduced in 1828 to ninepence and that to Stockton to tenpence, the latter soon afterwards increased to elevenpence.** For drawing the waggons with his horse at the bottom of Brusselton east inclined plane, coupling them, delivering the tickets that

* Sub-committee minutes, 18th August, 1826.

† *Ibid.*, 3rd October, 1826.

‡ *Ibid.*, 13th July, 1827.

Ibid., 6th June, 1828.

§ Sub-committee minutes, 6th and 20th July, 1827.

|| *Ibid.*, 24th February and 15th December, 1826.

¶ Sub-committee minutes, 18th April, 1828.

** *Ibid.*, 23rd June, 1826, and 28th March, 1828, and Leaders' Book, October, 1827, to December, 1828.

came with them and pumping water for the locomotive engines, James Garthwaite was, in 1826 and 1827, paid 7s. a day but, on the 29th of March, 1828, the directors contracted with him to do the work from the 1st of April for a farthing per ton.*

It cost the Company about tenpence to move a ton of coals from one end of the line to the other, when locomotive engines were used—the cost of finding and repairing the engines being estimated at $\frac{1}{3}$ d. per ton per mile,† and about 1s. 0 $\frac{1}{2}$ d. when the waggons were drawn by horses.

The cost of repairing the line varied: some portions were let in 1826 at £30, others at £35, £37 and £48 per mile, the average price being £40.‡ Portions were let in 1828 as low as £26 and £27.§

Not only did the Company enter into contracts for the working of the traffic, but in July, 1827, they let the roping of the inclined planes—a principle to which John Grimshaw, who had supplied some of the first ropes, strongly objected, on the ground that it was speculating on the good management of others in the wear of his ropes and solely at his risk.|| Rowland Webster undertook the contract at a farthing per ton on all the coals, etc., passing over the inclined planes, a certain quantity being guaranteed, viz., 120,000 tons for the Brusselton planes and 70,000 tons for the Etherley planes.¶

The weighing machines only were kept in the Company's hands, and the arrangements in connection with them throw a curious light on the conditions of service in the early days of the Stockton and Darlington Railway. Joseph Anderson was engaged on the 14th of May, 1827, to live at the Spout Lane Weigh House, East Thickey, near the present Shildon Station, "to weigh and keep accounts there and make himself generally useful upon the line."*** The duties under the head of making himself generally useful consisted of keeping an account of the time worked by the mechanics at New Shildon; attending at the foot of Brusselton East Bank to receive the tickets that came with the waggons; inquiring into, and reporting upon, any breaches of the bye-laws occurring on the line, etc. These duties took him away to Stockton, Yarm and Darlington at least twice

* Sub-committee minutes, 27th March, 1828.

† James Walker's report to the directors of the Liverpool and Manchester Railway, 1829, p. 36.

‡ Sub-committee minutes, 19th May and 28th July, 1826.

§ Sub-committee minutes, 25th January, 1828. Pay Bills, January, 1828.

| John Grimshaw to Joseph Pease, 20th August, 1828. N.E.R. Muniments.

¶ Sub-committee minutes, 18th and 29th July, 1827.

** *Ibid.*, 22nd June, 1827.

a week, and, as he had no assistant, his wife was obliged on such occasions to relieve him at the weigh house.* For these services he received at first 16s. and then 17s. a week, paying "such rent for his cottage as the Company might think fair and reasonable," which was £5 a year. Percival Tully, besides attending to the weighing machine near the junction of the Darlington branch with the main line, for which he was paid 21s. a week, had also to examine the waggons as they passed the weigh house in order to see that the axles were properly greased by the enginemen and report any cases of neglect.† Robert Garbutt, at the Stockton depôts, in receipt of 15s. a week, was expected, when not required at the books, to be "industriously employed in the making of wood pins for the use of the Company,"‡ these pins having to be five inches long, an inch and three-eighths square at the head, and one inch and an eighth at the bottom, with the angles taken off.§ The Company claimed his services from 6 a.m. to 6 p.m., and, as he made a number of additional pins in his own time, for which he was paid 8d. a hundred, his day really began at 5 a.m. and ended at 8.30 p.m.|| George Jackson, at the Darlington depôts, with 16s. a week, had to find his own candles.¶

The Company's charge for weighing was at first ½d. per ton, but not being remunerative, it was increased from the 11th of November, 1826, to 1d.**

To those who were watching from different parts of the country the progress of the railway in operation, the directors could exhibit very tangible results. These, while not sensational, were yet sufficiently encouraging to justify the note of satisfaction which ran through the annual reports, and afforded grounds for the confidence of the directors that the Stockton and Darlington Railway "would still effect greater things."†† They were not only able to pay a dividend of 5 per cent.—on the prospect of which Edward Pease had dwelt so effectively in 1818—but to apply a part, and a very considerable part, of the profits to the new works. Here, in statistical form, are the results of the working of the line during the experimental period comprised between July 1st, 1826, and June 30th, 1828:—

* Jos. Anderson to the committee, 25th September, 1829. N.E.R. Muniments.

† Sub-committee minutes, 23rd March, 1827.

‡ *Ibid.*, 4th July, 1828.

§ Note on draft of sub-committee minutes, 23rd May, 1828.

|| Robert Garbutt to the committee, 20th November, 1828.

¶ Sub-committee minutes, 11th November, 1826.

** *Ibid.*

†† Report of the committee to a general meeting held 10th July, 1827.

REVENUE.										
Year ending June 30th, 1827.						Year ending June 30th, 1828.				
	Miles run.	£	s.	d.	Percentage of Gross Receipts.	Miles run.	£	s.	d.	Percentage of Gross Receipts.
<i>Passenger Traffic—</i>										
Coaches	45,460	563	14	9	3·08	33,344	576	18	6	2·49
<i>Goods Traffic—</i>										
Lead, Timber, Iron and Merchandise	Tons. 12,846½	1,240	4	1	6·78	Tons. 12,404	1,283	11	11½	5·54
<i>Mineral Traffic—</i>										
Coals	80,446	14,456	16	7	78·97	119,289½	19,373	18	8	83·60
Lime and Stone ...	8,246¼	1,026	16	10	5·61	9,954¾	1,108	15	8½	4·78
<i>Miscellaneous Receipts</i>		1,018	3	6	5·56		832	19	7	3·59
		£18,305	15	9	100·00		£23,176	4	5¼	100·00

EXPENDITURE.										
						Year ending June 30th, 1827.				
						£	s.	d.		
										Year ending 30th June, 1828.
						£	s.	d.		
Haulage, Repairs of Locomotives, Fixed Engines and Waggon, Maintenance of Way, Works, etc.						11,775	10	3	12,203	0 6
<i>Net Receipts</i>						6,530	5	6	10,973	3 11
Ratio of Working Expenses to Receipts						64·33	%		52·65	%
Gross Earnings per mile of road						678	0	0	858	0 0
Dividend on Capital of £67,500						3,375	0	0 = 5 %	3,375	0 0 = 5 %

Of the coal conveyed during the year ending 30th June, 1827, 23 per cent., or 18,588 tons, went down the line for shipment, a result which, the directors stated, had "surpassed their most sanguine expectations."* The following year, however, 44½ per cent. of the total quantity carried, or 52,290 tons, were for exportation.

* Report of the committee to a general meeting held 10th July, 1827.

ABSTRACT

Of the Cash Account for the Year ending 30th of June, 1827.

Dr. Jonathan Backhouse, Treasurer, in Account with the Stockton & Darlington Railway Co. Cr.

	£.	s.	d.		£.	s.	d.
To Cash received in Sundry Loans	30,753	11	6	By Balance due to the Treasurer	10,459	3	9
Do. do. on account of Terenge &c.	16,876	8	7	Cash paid on account of dividends	725	1	10
				Stephenson & Co. for permanent Engines	4,000	0	0
				H. Birkbeck, repayment of his Loan	1,000	0	0
				Interest, Discount, and Commission	3,371	5	4
				Cash paid on account of Land for the			
				Main Line, Croft Branch, Black Boy			
				Branch, and Hagger Leases Branch	4,508	4	2
				Newmarket and Co. for Kenton Branch,			
				purchased for Black Boy Branch	528	4	6
				Cash on account of Law Expenses	300	0	0
				Allowance to Owners of Black Boy Col-			
				liery, to the 1st June last, & order			
				of General Meeting	1,037	9	4
				Do. to W. L. Wharton, & Co.	151	13	0
				Additional outlay (viz) Depots, Erec-			
				tions, &c. on the Main Line and			
				Branches, Locomotive Engines, &c.	5,606	12	0
				Cash paid for sundry Materials and			
				Labour, for Waggon, &c. for in-			
				crease of Carrying establishment	3,674	17	5
				Sundry contingent Expenses (viz) Smith			
				and Wright's Work, Labour, Dam-			
				ages, Freight, Carriage, Agents' and			
				Clerks' Salaries, Rates, Stationary,			
				Travelling Expenses, Postages, &c.	4,612	18	4
				The Monthly Pay Bills (viz) Labour			
				and Consumable Articles, at the fixed			
				and Locomotive Engines, and for ad-			
				ditional Horses employed in leading			
				Coals and Lime	2,507	7	9
Balance due to the Treasurer	2,691	1	6	Do. as under:—			
				Repairing the Way & Materials	1818	16	2
				Sundry Contingent Labour	1060	2	4
				Cleaning Cuts and repairing			
				embankments	514	15	6
				Repairing Waggon, Engines, &c	527	1	7
				Leading, &c.	434	8	7
					4355	4	2
					11,775	10	3
					£50,321	1	7
Amount of Two Instalments of 20 & Cent.							
New Share Account	13,000	0	0	Balance	2,691	1	6

Receipts for Tonnage, &c.

	Coals.				Lime.				Lead, Timber, Iron, and Merchandise.				Coaches.				Sundry Tonnage and Sale of Bricks.		Total.	
	Tons.	£.	s.	d.	Tons.	£.	s.	d.	Tons.	£.	s.	d.	Miles.	£.	s.	d.	£.	s.	d.	
1826 July	4814	1014	4	6	602	75	16	7	1006½	92	7	9	3972	49	13	1	129	12	0	
August	3719	587	17	0	532	41	14	4	1170½	115	9	5	4568	64	2	0	29	9	10	
September	7060½	1520	4	2	817½	115	2	9	927½	96	10	10	4448	61	18	0	309	0	11	
October	7662½	1332	2	5	532	54	1	11	1181½	112	13	4½	4544	73	1	0	189	3	1	
November	6666½	1166	11	9	2304	25	5	4	1761	118	9	7½	5008	51	4	6	87	13	4	
December	4945½	1027	10	6	99½	21	15	6	1079½	103	17	7	3156	30	13	0	2	8	1	
1827 January	3532½	705	13	2	53½	4	18	11	870	79	9	9	5006	28	13	4	51	10	1	
February	5766½	1044	17	6	181½	10	0	7	1036½	96	14	7	2722	30	11	2	49	1	9	
March	7279½	1420	17	3	211½	38	18	0	898	89	8	8	3064	34	14	0	43	0	6	
April	7707½	1267	10	11	976½	128	2	1	1121	109	6	0	3262	37	4	8	120	5	4	
May	10412½	1649	6	8	2054	247	9	5	1250½	119	6	8	3929	45	4	2	6	18	7	
June	10041	1728	9	5	2075½	263	11	5	1116½	106	9	10	3880	47	15	10	0	0	0	
	80,446½	14,455	5	2	8,246½	1026	16	10	12,846½	1240	4	1	45,460	563	14	9	1018	3	6	
																	18,305	15	9	

*Of which 18,588 Tons were exported, 26,385 do. sold at Darlington, 10,560 do. at Yarm, 21,866 do. at Stockton.

FIRST PRINTED STATEMENT OF RAILWAY ACCOUNTS.

The mineral traffic would have been still greater if it had been possible for the Company to have brought into operation the various branches which were intended to act as feeders to the main line. These they were unable to complete for want of funds.

Having started with the principle of keeping down the number of shares,* they had been compelled to borrow large sums of money, which, at the close of 1825, exceeded the whole amount of the subscriptions, and there was, moreover, a floating debt of about £10,000. It was necessary to raise further loans, but practically impossible to do so at a time of monetary panic which had caused the Tees Bank at Stockton to suspend payment, and before the earning capacity of the line had been demonstrated. Such was their pecuniary embarrassment in the early months of 1826 that they were unable to pay their current expenses. Once more, in the hour of difficulty, Edward Pease came forward and laid the proprietors under renewed obligations by advancing the money to pay the wages of the workmen, etc.,† viz.:—£1,000 on the 27th of January and a further sum of £895 on the 18th of March.‡ It was unfortunate that, at this period, the directors should have been called upon to obtain a change of hands for the Company's bonds. To their advertisement for a loan of £40,000 in one sum or several sums§ there was but a timorous response, offers of no more than £6,000 being received. These financial difficulties interfered with the works on the railway and imposed an arbitrary limitation on the development of the traffic. Not only were the directors deprived of the additional revenue which should have accrued from the working of these branches, but as the postponement of the works affected the relative position of the coal-owners on the line, they were called upon to pay compensation to those who were shut out from the benefits of railway transport. An allowance of 1s. 6d. per ton was made to the owners of Black Boy Colliery on all their coals coming down the railway, which, with a further concession of £200 for the period preceding the rebate, amounted on the 30th of June, 1827, to £1,037 9s. 4d. An allowance was also made to Mr. William Lloyd Wharton, the owner of Coundon Colliery, which on the same date amounted to £151 13s. To enable the Company

* Joseph Pease to Edward Pease, 30th May, 1826. Railway Collection, Newcastle Public Library.

† Sub-committee minutes, 27th January and 17th March, 1826.

‡ *The Two James's and the Two Stephensons*, 1861, p. 47.

§ *Newcastle Courant*, 11th, 18th and 25th February, 1826.

to build inns at Stockton and Darlington for the accommodation of the public using the railway, Joseph Pease advanced on the 28th of July, 1826, the sum of £1,305 19s.* During the course of the half-year several other loans were obtained and the directors found themselves in a position to resume the work of constructing the branch lines. With the funds at their disposal, they could not undertake the formation of more than one branch at a time, and it was no easy matter to decide which branch should have the priority. If the Croft branch were opened before the Hagger Leases branch the owner of Buterknowle and Copley Bent Collieries would be unable to maintain his position in the Richmond market, since his competitors could make use of the railway for the greater part of the way, and he would be entitled, under an agreement, to claim an indemnity for any diminution in his trade.† On the other hand, to postpone the execution of the Coundon branch meant continuing the allowance to the owners of the Black Boy and Coundon Collieries.

The Board was divided on the question.‡ The Peases wished to see the Croft branch completed, on the ground that large quantities of goods and



minerals were expected to pass along it into the North Riding of Yorkshire. Jonathan Backhouse, who had acquired a joint interest in the Black Boy Colliery with Joshua Ianson, proposed that the preference should be given to the Coundon branch, and, after some discussion, he carried his point. The formation of the branch was begun about the middle of March, 1827, and, by the 10th of July, the line, which stopped short a little beyond the Denburn Beck, was stated to be "in a sufficient state of forwardness to be

* Sub-committee minutes, 28th July, 1826.

† Minutes of evidence on the Stockton and Darlington Railway Bill, 1828, pp. 27 and 28.

‡ *Ibid.*

advantageously used by the owners of some adjacent coal-fields.”* The stationary engine for working the inclines had yet to be fitted up, and for some months the traffic was led by horses, the drivers being instructed not to take more than two waggons down the inclines at a time.

Having brought the Black Boy branch into use, the directors set to work in August, 1827, to finish the Croft branch, and, three months afterwards, decided to proceed with the laying of the Hagger Leases branch.† The Company were by this time free from financial embarrassment. They had raised new capital and applied it to the liquidation of their debts, and, as the credit of the Company became more firmly established, the directors found little difficulty in borrowing money. The commercial success of the railway was no longer problematical. At the beginning of 1827 the shares of the Company were at a premium of £20.‡ and before the end of the year their price in the market was £160.§ Not only was the railway benefiting the proprietors, but it was diffusing general prosperity throughout the district which it served. Such facts were fatal to prejudice, and the country, impressed by them, became more sympathetic in its attitude to the many projects for railways then before it.

There was a general wish to know how much of the success of the Stockton and Darlington Railway was due to the employment of locomotive engines on the line.

At the close of 1825 the *Gentleman's Magazine* drew attention to the “admirable manner in which the locomotive engine was doing all, and more than all, that was expected of it.”|| A few months later the committee of the Liverpool and Manchester Railway made allusion to this “power for the conveyance of goods and passengers which they looked forward to as highly advantageous both to the Company and the public,” adding “they had never doubted that the ingenuity of the country would be exerted to construct an efficient and unobjectionable machine for this purpose.”¶

Then, while the country was waiting for the locomotive engine to justify the good opinion which had been formed of it, some reports, unfavourable to the new tractive power, got abroad. In September it was rumoured—and the rumour found its way into the committee-room of the Birmingham and Liverpool Railway Company—that the locomotive engines had been

* Report of the committee to a general meeting held 10th July, 1827.

† Sub-committee minutes, 16th November, 1827. ‡ *Carlisle Journal*, 7th January, 1827.

§ Richard Otley's evidence, Stockton and Darlington Railway Bill, 1828, p. 130.

|| *Gentleman's Magazine*, vol. xcv., supplement, p. 637.

¶ Report to subscribers, dated 22nd May, 1826.

abandoned on the Hetton Colliery Railway.* It was true they had been removed from the lower portion of the line in order that the fixed engines—which had not, up to that time, been fully employed—might work this section upon the reciprocating principle, but they had been retained on another portion of the line near the pits.

There were also disquieting rumours with regard to the locomotive engines of the Stockton and Darlington Railway, which were working under great disadvantages. Scarcely a single journey, we are told, was performed by them without being interrupted by the horses or other trains of carriages passing in a contrary direction. At each end of the locomotive part of the line great delay was occasioned by the irregular supply of waggons which, from the nature of the trade and other local circumstances, it was impossible to avoid.† Stoppages were often caused by the waggons leaving the rails at the points leading into or out of the many sidings, owing to the switches getting wrong, for these were only held in position by wedges which were frequently shaken out.‡ Then the engines suffered from the careless, and sometimes reckless, driving of the enginemmen, who were not, as Robert Stephenson declared in 1828, “the most manageable class of beings.”§

There is not, however, the slightest foundation for the statement published in 1879, 1889 and 1892 by Mr. J. W. Hackworth and since repeated by uncritical writers, that, but for the fact of “*two of the most influential members of the Company (Messrs. Edward Pease and Thomas Richardson) being partners with Stephenson in the Forth Street Engine Works, Newcastle, from whence four of the first locomotives were supplied—they would have been abandoned long before an experimental period of eighteen months had been allowed,*”|| and there is no evidence whatever that, after considering “the proposition from Timothy Hackworth to be allowed to make an engine in his own way, the directors resolved that ‘*as a last experiment, Timothy shall be allowed to carry out his plan.*’”¶

* Henry Hunt to the Stockton and Darlington Railway Company, 22nd September, 1826. N.E.R. Muniments.

† Stephenson and Locke's *Observations on the Comparative Merits of Locomotive and Fixed Engines*, 1829, p. 11.

‡ Rastrick's *Report to the Directors of the Liverpool and Manchester Railway*, 1829, p. 73.

§ *Life of Robert Stephenson*, by J. C. Jeaffreson, vol. i., p. 115.

|| *Royal Cornwall Gazette*, June, 1879; *Railway Herald*, 27th April, 1889; and *A Chapter in the History of Railway Locomotion, etc.*, appendix by John Wesley Hackworth, 1892, p. 25.

¶ *Ibid.*

As a matter of fact, three months before the remodelling of Wilson's engine was begun, the directors had ascertained by experiment that the cost of carrying 4,263 tons by horses was £163 8s. 10d., whereas by locomotive engines it was £70 6s. 6d., being a difference in favour of the latter of £93 2s. 4d.,* and in a report presented on the 10th of July, 1827, they stated: "It may be satisfactory to the general meeting to be informed, as the result of the strict scrutiny into the subject, that there appears to be a saving of nearly 30 per cent. in favour of haulage performed by the locomotive engines, when compared with its being done by horses."

At this time the Stockton and Darlington Railway Company possessed six engines, viz.:—

No.	Name of Engine.	Name of Builder.	Date of Delivery.
1.	Locomotion ...	Robert Stephenson & Co. ...	September, 1825.
2.	Hope ...	„ „ „ ...	November, 1825.
3.	Black Diamond	„ „ „ ...	April, 1826.
4.	Diligence ...	„ „ „ ...	May, 1826.
5.	Chittaprat ...	Robert Wilson ...	—
6.	Experiment ...	Robert Stephenson & Co. ...	March, 1827.

Of these, four were in constant use, one was kept in reserve to take the place of any of the others when under repair. The "Chittaprat" or "Wilson's engine," as it was usually called in official documents, though it worked unsatisfactorily when on trial, had been purchased for a small sum for the sake of its boiler and was laid aside. Nos. 1, 2, 3, and 4, which weighed 6 tons 10 cwts. each in working order, were all similar to each other in design: the boiler, 10 feet in length and 4 feet in diameter, with a straight flue passing through it and continued upward as the chimney, there being neither fire-box nor smoke-box; two vertical cylinders, 10 inches in diameter and the stroke 24 inches, placed partly within the boiler, the piston rods, guided by parallel motions, acting upon the wheels by means of cross-heads and connecting-rods. The wheels, four in number, coupled, were 4 feet in diameter: the axles ran in cast-iron plummer-blocks. There were only two eccentrics, which had to be changed in position for back and forward gear. The boiler was worked at a pressure of 25 pounds per square inch. Having but 60 square feet of heating surface, steam was generated slowly and the engines sometimes came to a standstill when at work. These old engines had to be started by hand-gearing and controlled without brakes.

* Sub-committee minutes, 22nd June, 1827.

Not having the steam whistle at this date, the enginemmen gave warning of danger by ringing a bell.

Of No. 6 no plan exists. It ran on four wheels, 4 feet each in diameter, and is stated to have had a return flue. Its cylinders, according to the same authority, were placed horizontally, half in the boiler and fastened to the flue; the connection between the piston rod and the crank pins outside its wheels was made by means of levers.*

More engines were required, and in September Robert Wilson offered to build one for the Company that would answer their purpose better than those in use, for, said he, "I saw several improvements might be made to them when I was toiling with my unfortunate one"† (the "Chittaprat"). Wilson being a man of singular ingenuity, it is to be regretted that an opportunity was not afforded him of putting his ideas into execution. The need for additional locomotive power became more pressing after the 1st of October when engine No. 2 (the "Hope") received "grievous injury" at Stockton.‡ Through the carelessness of the fireman it had been left standing with the safety-valve fixed down, and the confined steam setting the wheels in motion, it ran away along the wharves doing a great amount of damage there. It was decided to construct a locomotive engine in the Company's own shops at Shildon, utilising the boiler of Wilson's engine. This engine was the "Royal George" of famous memory, which started work on the 29th of November, 1827, in the charge of William Gowland,§ the first fireman of No. 1 and the first driver of the "Black Diamond."

Between this date and the 13th of December it travelled 434 miles, hauling 442 tons of coals from Shildon to Stockton and 115 tons from Shildon to Darlington, in other words, it travelled about $36\frac{1}{6}$ miles a day, hauling from fifteen to twenty loaded waggons to Stockton, and from sixteen to twenty-three to Darlington; the former containing from 39 to 53 tons, the latter from 44 to 64 tons, the average load being $46\frac{1}{2}$ tons, or $2\frac{1}{4}$ tons more than the average load of the other engines during the same period.

Between the 14th of December, 1827, and the 22nd of January, 1828, the "Royal George" was in the shops, undergoing some repairs to its boiler. Was this heavy engine at first without springs? As in December, Timothy

* *The Engineer*, Oct. 31, 1879, p. 322.

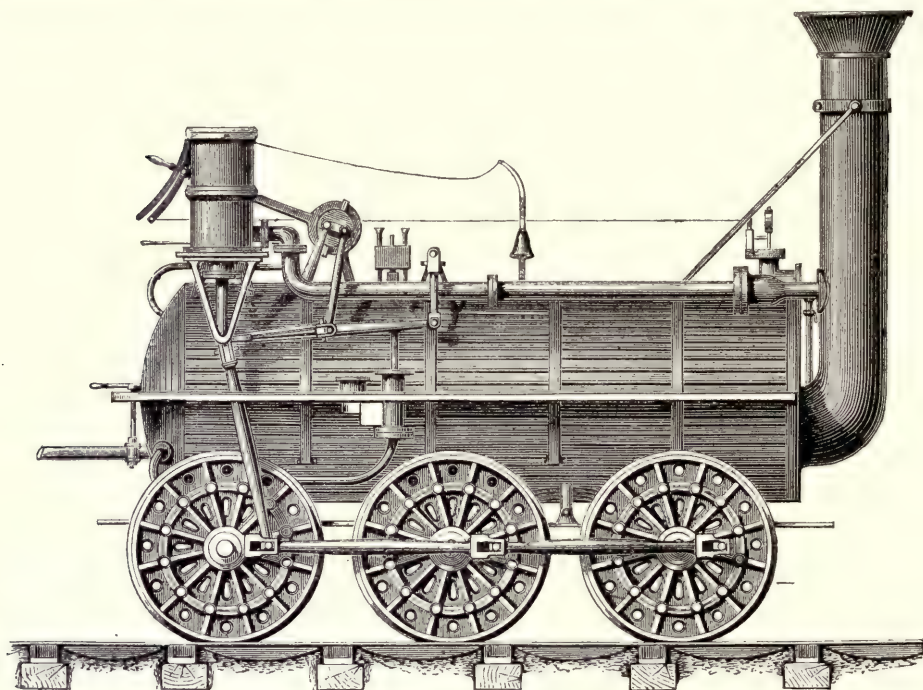
† Robert Wilson to the Stockton and Darlington Railway Company, 28th September, 1827.

‡ Richmond's *Local Records of Stockton*, p. 151; sub-committee minutes, 5th October, 1827.

§ Leader's Book, N.E.R. Muniments.

Hackworth, at the expense of the Company, "went to Killingworth to see the locomotive engine with springs and malleable iron rims"* it would seem as if the question of springs for the new engine was then under consideration.

The "Royal George," for constructing which Timothy Hackworth received a bonus of £20, was an engine of great hauling capacity, well adapted to the traffic of the Stockton and Darlington Railway. It was, as



From The Engineer, Oct. 20, 1879, p. 276, by permission.

THE "ROYAL GEORGE" ENGINE.

Mr. Walker declared in his report of 1829, "undoubtedly the most powerful"† which, up to that time, had been made. This superior power of traction it owed: (1) To its greater evaporative surface, 141 square feet as against 60 square feet, an advantage, however, with two drawbacks: it rendered necessary the use of a second tender and diminished the area of the

* Report to committee, 26th December, 1827. N.E.R. Muniments.

† Walker's *Report on the Comparative Merits of Locomotive and Fixed Engines*, 1829, p. 21.

fire-place; and (2) to its greater weight, which increased the adhesion of the wheels. The claim which has been set up on behalf of Hackworth that this engine was the first to possess a blast-pipe cannot for one moment be entertained. We have the direct statement of Robert Stephenson and Joseph Locke, made in 1830 with the approval of George Stephenson, and never contradicted, that shortly after the first locomotive engine was tried on the Killingworth Colliery Railway, the steam, having performed its office in the cylinders, was conveyed into the chimney where it escaped in a perpendicular direction up the centre, increasing the draught and consequently the temperature of the fire.* It no more follows that Stephenson did not know the value of the steam-blast because he used bellows, worked by eccentrics underneath the tender, for stimulating the draught in the "Lancashire Witch," an engine built to burn coke and work heavy gradients, having two distinct tubes passing longitudinally through the boilers with a fire in each, than that Hackworth himself was ignorant of the same contrivance because he applied an exhaust steam jet under the fire-grates of the "Royal George" to accelerate the combustion of the fuel. It is evident from a letter of Stephenson's, dated 13th August, 1829, that he did understand the importance of the blast, or as he called it, the exhausting-pipe, for he had been making an experiment to see whether it would act as well near the top of the chimney as lower down.†

The "Royal George" was a good serviceable engine, on the possession of which the Stockton and Darlington Railway Company had reason to congratulate themselves, but it was certainly not "the first to exceed in efficiency the working of horses."‡ It neither "decided the question of locomotive practicability"§ nor "finally and for ever settled the expediency of the locomotive and railway system."||

The chief points of difference between the "Royal George" and the other engines were these:—The boiler was of greater dimensions, 13 feet long by 4 feet 4 inches in diameter, it had, as already stated, a return flue instead of a single one; the cylinders, of 11 inches diameter and 20 inches stroke, though vertical, were placed on each side of the boiler, at the end furthest from the chimney, instead of being placed partly inside the boiler one in front of the other; the pistons worked downward instead of upward,

* *Observations on the Comparative Merits of Locomotive and Fixed Engines*, by Robert Stephenson and Joseph Locke, 1830, p. 6.

† Jeaffreson's *Life of Robert Stephenson*, vol. i. p. 121.

‡ *A chapter on the History of Railway Locomotion*, p. 21. § *Ibid.*, p. 22 || *Ibid.*, p. 35.

acting directly on the first pair of wheels. An experiment made in the presence of Robert Stephenson, Joseph Locke and Timothy Hackworth shows what the engine was capable of doing on occasion; it appears that it took $48\frac{1}{4}$ tons of goods up and down a portion of the line having a gradient of 1 in 528, a total distance of 5,000 yards, at the rate of $11\frac{2}{10}$ miles per hour, and that the steam was blowing off when the experiment concluded.*

While the "Royal George" was being built in the Shildon shops the Company were in treaty with Messrs. R. Stephenson & Company for the purchase of a new locomotive engine which that firm had just completed. The special feature of its design was the use of small water tubes for effecting more rapidly the evaporation of steam. A similar plan, however, had been described by Trevithick in his specification of 1815. An inquiry from the cautious directorate which, as early as November, 1825, had addressed an official request to the firm "not to send any engine with new and experimental apparatus, but such fitting up as hath been tried and proved,"† drew from Mr. Harris Dickinson, the manager of the Newcastle works, the following letter of explanation:—"In answer to thy favour of the 20th inst., respecting our new locomotive engine, we are of opinion that there is little or no more risk attending this engine than the former ones. The only danger, I apprehend, is from the bars burning away, and so blowing out the hot water and scalding those who may be employed at the engine; but how can these hollow tubes burn away so long as they are filled with water? And if, from any neglect, the communication between the boiler and fire tubes should be stopped, so that the tubes burned into holes, there could not then be any water to blow up."‡

An assurance having been given to the Company that the weight of the engine would not exceed 6 tons 15 cwts., it was sent to Darlington for trial.§

The result of the trial was to show that the fire-place would have to be altered. The reason for this can only be conjectured. Probably, on account of the small water-tubes, it was found necessary to lower the fire-grates, and this could only be done by adding a fire-box. Hackworth was afraid that, if the fire-place alone were altered, too great a proportion of the weight would be thrown on the two hind wheels. Stephenson's manager, however, suggested that the experiment should be tried and, if any bad

* Walker's *Report on the Comparative Merits of Locomotive and Fixed Engines*, 1829, p. 21.

† Sub-committee minutes, 18th November, 1825.

‡ Letter from Harris Dickinson to Edward Pease, 24th October, 1827. N.E.R. Muniments.

§ Sub-committee minutes, 16th November, 1827.

effects from the disproportionate weights should afterwards occur, he proposed to bring the engine back again to Newcastle and fit it up with six wheels, which, he considered, would be an entire remedy.* About this time Robert Stephenson had been discussing with his father the desirability of reducing the size and ugliness of the locomotive engines by applying the cylinders either on the side of the boiler or beneath it entirely, and the latter had agreed to an alteration which, it was thought, would considerably reduce the quantity of machinery as well as the liability to mismanagement.† These ideas were embodied in the new engine which was delivered in February, 1828. No. 7, the "Rocket," a year older than its famous namesake, cost, with its tender, £550. How long it was before the water tubes of this engine, like those of the engines supplied to the St. Etienne Railway, "became furred with deposit and burnt out," it is impossible to say. The weight of the engine proved too great for the strength of the rails and, on the 28th of March, 1828, it was ordered to be laid off until it had been placed on six wheels.‡ The Newcastle firm being then engaged in constructing under pressure the "Lancashire Witch" for the Bolton and Leigh Railway Company,§ some delay took place in making the alteration. Stephenson suggested to his son that the Darlington engines should be altered to the plan of this new engine. "By doing so," he added, "the last engine will not be found too heavy for the road."¶ On the 27th of May the Company were assured that no time would be lost with their travelling engine frame, the makers being busy with the springs, and the frame parts being expected at any time from Bedlington.¶ On the 4th of July the directors again passed a minute ordering the engine to be laid aside,** and the following day they were informed that R. Stephenson & Company were pushing their six-wheel frame as much as possible.††

The alteration appears to have been made during the latter part of the month, and on the 31st of October the result is recorded in the following minute:—"From an accurate observation of the locomotive with six wheels and springs, the committee have every reason to be satisfied the same is

* Harris Dickinson to Edward Pease, 26th November, 1827. N.E.R. Muniments.

† Jeaffreson's *Life of Robert Stephenson*, vol. i., p. 115.

‡ Sub-committee minutes, 28th March, 1828.

§ R. Stephenson & Co. to the Stockton and Darlington Railway Company, 11th June, 1828.

¶ Jeaffreson's *Life of Robert Stephenson*, vol. i., p. 121.

¶ R. Stephenson & Co. to Timothy Hackworth, 27th May, 1828. N.E.R. Muniments.

** Sub-committee minutes, 4th July, 1828.

†† R. Stephenson & Co. to the Stockton and Darlington Railway Company, 5th July, 1828.

a great improvement. It is resolved that Timothy Hackworth be directed to attend to having a similar improvement made in all our engines as early as possible.”*

The Stockton and Darlington Railway Company had two locomotive engines on six wheels in January, 1829, one weighing, with the water in the boiler, 12 tons 7 cwt. 2 qrs., the other 10 tons 2 cwt.,† yet from this minute it would appear that in October, 1828, there was only one six-wheeled engine on the line.

Was the “Royal George” placed on six wheels after this date? The fact of Messrs. R. Stephenson & Company casting, between the 23rd of August and the 14th of November, 1828, from the drawings and template of Timothy Hackworth, some of those curious plug-wheels which were first used on the “Royal George,” seem to point to this conclusion. These wheels, it may be noted, differed somewhat from those shown in the illustrations of the “Royal George,” having eight, instead of twelve holes in the plate-part—the diameter of them about 3 inches—and eight, instead of twelve plug-holes in the inner ring. The diameter of this inner ring was 2 feet $6\frac{3}{4}$ inches.‡

Rumours unfavourable to the locomotive engine were set afloat again in July, 1828. It was reported in Manchester that the horses were beating the engines off the line.§ This, however, was not the case. Within less than four months the boilers of two of the engines had exploded on the line, one on the 19th of March, at the foot of Simpasture, the other on the 1st of July at Aycliffe watering station. Both accidents were due to the same cause—the carelessness of the enginemen in allowing the weights of the safety-valves, which had been fixed down during the journey, to remain in that position while the engine was at rest.|| John Gillespie was killed on the first occasion and John Cree on the second. The damaged engines—No. 2, according to J. W. Hackworth,¶ and No. 1**—were rendered useless for a time, and No. 7 being laid off in July, more work had necessarily to be done by the horses.

* Sub-committee minutes, 31st October, 1828.

† Rastrick's *Report to the Directors of the Liverpool and Manchester Railway*, 1829, p. 48.

‡ R. Stephenson & Co. to Timothy Hackworth, 17th November, 1828. N.E.R. Muniments.

§ *A chapter in the History of Railway Locomotion*, 1892, p. 5.

|| Walker's *Report on the Comparative Merits of Locomotive and Fixed Engines*, 1829, p. 33.

¶ Speech at Shildon, 9th November, 1875, *Darlington and Richmond Herald*, 13th November, 1875.

** Jubilee number of *Northern Echo*, 25th September, 1875, p. 2.

So far was it from being true that horses were beating the locomotive engines off the line in 1828 that, whereas in the first half-year the engines led 35,201½ tons and the horses 31,885¾ tons, in the second half-year the engines led 39,349 tons and the horses 23,349 tons, the difference in favour of steam-power having increased from 3,315¾ tons to 16,000 tons.

There were enemies to steam locomotion at this time, enemies without reason who, as Robert Stephenson complained,* “opposed the engines merely because certain things had been said against them,” and their influence was felt in the board-room of the Liverpool and Manchester Railway Company. In October, 1828, a deputation from that body consisting of two of the directors and the secretary (Henry Booth), visited Darlington and the neighbourhood of Newcastle-upon-Tyne, for the purpose of arriving at a decision as to the motive power which should be adopted on their line.

In consequence of the conflicting nature of their report this visit was followed by another, that of Messrs. Walker and Rastrick on the 17th, 18th, 19th and 20th of January, 1829. From their report we learn that the Darlington engines, since the accident in July, 1828, had been furnished with additional spring safety-valves;† that it was the practice at the time to heat the water at the watering stations for the supply of the engines;‡ that one set of tyres was worn out in ten weeks upon the Darlington way;§ that the summer work of Hackworth’s engine was twenty-four empty waggons from Stockton towards the pits at 5½ miles per hour and the winter work twenty waggons at the same speed; the other smaller engines taking twenty waggons in summer and sixteen in winter at 5 miles per hour;|| that the power of draught of the engines was equal to the following upon a level surface:—¶

HACKWORTH’S ENGINE.

	5 miles.	SUMMER.		10 miles.	5 miles.	WINTER.		10 miles.
		8 miles.	8 miles.			8 miles.	8 miles.	
Goods	46·75	25·00	17·75	39·90	21·00	14·30		
Waggons	23·10	12·50	8·80	19·80	10·20	7·20		
Engine and Tender ...	16·50	16·50	16·50	16·50	16·50	16·50		
Tons	86·35	54·00	43·05	76·20	47·70	38·00		

* Robert Stephenson to Timothy Hackworth, 7th July, 1828. *A chapter in the History of Railway Locomotion*, p. 5.

† Walker’s *Report on the Comparative Merits of Locomotive and Fixed Engines*, 1829, p. 33.

‡ *Ibid.*, p. 24.

§ *Ibid.*, p. 25.

|| *Ibid.*, p. 19.

¶ *Ibid.*, p. 46.

SMALLER ENGINES.

	5 miles.	SUMMER. 8 miles.	10 miles.	5 miles.	WINTER. 8 miles.	10 miles.
Goods	34·66	18·66	13·33	28·75	15·00	10·33
Waggons	17·33	9·33	6·66	14·50	7·50	5·20
Engine and Tender ...	12·00	12·00	12·00	12·00	12·00	12·00
Tons ...	64·00	40·00	32·00	55·25	34·50	27·53

The "Royal George" is said to have conveyed 22,442 tons of coals during the first clear year—1828 (probably between 22nd January, 1828 and 22nd January, 1829)—at a cost of £466,* but there is no record of the work done by the other engines during the same period.

From the work done by the enginemen in 1828 much information, may be gained as to the work done by the engines. This will appear from the following statement:—†

Name of Engineman.	No. of Days Employed.	Total number of Miles Run.	Coals led to Darlington, Yarm, Stockton, and sundry other places.	Tons Carried One Mile.	Average number of Miles Run per Day.	Average Quantity of Coals led per Day.	Tons Carried One Mile per Day.
			Tons.			Tons. Cwt.	
James Stephenson ...	260	9,941	14,366 =	252,403	38·24	55 5	971
Robert Morrow ...	271	10,820	15,356½ =	274,364	39·94	56 13	1,012
William Gowland ...	269	10,679	20,231 =	340,099	39·70	75 4	1,264
Michael Law ...	244	9,923	13,911 =	266,938	40·67	57 0	1,094
John Cree * ...	125	4,906	6,456 =	120,710	39·25	51 12	966
Edward Corner † ...	79	2,973	4,230 =	74,346	37·63	53 11	964
		49,242	74,550	1,328,860			

* Killed at Simpashire, 1st July, 1828.

† Began leading, 5th September, 1828.

The total remunerative work done by the locomotive engines, it will be seen, was equal to 1,328,860 tons conveyed one mile. But, in addition to taking down 12,208 tons to Darlington, 4,467 tons to Yarm, 56,980 tons to Stockton and 895 tons to other places, exerting a tractive force between Shildon and Darlington for, say, one-fourth of the distance, and between Shildon and Stockton or Yarm for one-half the distance, they had to haul

* *A chapter in the History of Railway Locomotion*, p. 4.

† Compiled from Leaders' Book, October, 1827—December, 1828. N.E.R. Muniments.

back the empty waggons, weighing from 22 to 33 tons per train, up a series of planes varying in inclination from 1 in 2,112 to 1 in 104 and this was the heaviest part of their work. The resistance produced by the gravity not only of the waggons, but of the engine drawing them, was such that the draught of one ton to a distance of one mile *going up* the line may be considered, according to Pambour,* as equal to that of the same load to a distance of 2·5 miles *on a level*. The real work, therefore, performed by the engines in the conveyance of these 1,328,860 tons with the haulage of the dead weight in one direction and in drawing back the empty waggons, allowing for the ease of the draught downward, as well as taking into account the difficulty of the draught upward, was equal to the haulage of 2,567,219 tons to the same distance on a level plane.

The average quantity of coals led per day by each engineman practically represents the average daily work of the engine allotted to him, for, though he had the use of one of the spare engines when his own happened to be in the shops for repairs, the difference between the work performed by this engine and his own, if such there were, during a small portion of the year, would not affect the daily average. Gowland's engine, which is known to have been the "Royal George," appears from this table to have hauled per day, 15 per cent. more coals than Law's engine, 25 per cent. more than Morrow's and 30 per cent. more than Stephenson and Cree's. It should, however, be stated that 14 per cent. of the coals led by Gowland went to Darlington, between which place and Shildon little power of traction was needed, while only 2½ per cent. of Law's coals and 8 per cent. of Stephenson's and Morrow's went to this destination.

Name of Engineman.	No. of Days Employed.	Gross Earnings.	Deduction for Firebars.	Net Earnings.	Average Amount per Day.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
James Stephenson	260	263 0 10	8 2 10	254 18 0	0 19 7
Robert Morrow	271	285 12 6	9 3 4	276 9 2	1 0 8
William Gowland	269	354 4 7	9 5 0	344 19 7	1 5 8
Michael Law	244	278 1 10	8 6 0	269 15 10	1 2 1
John Cree	125	125 12 11	4 1 6	121 11 5	0 19 5
Edward Corner	79	77 12 0	2 9 8	75 2 4	0 19 0
		1,384 4 8	41 8 4	1,342 16 4	

* *Treatise on Locomotive Steam Engines*, 1836, p. 340.

As the enginemen were paid* according to the quantity of coals led, the contract price in 1828 being a farthing per ton per mile, the foregoing statement will show to what extent their interests were affected by the different hauling powers of the respective engines.

Gowland made 3s. 7d. a day more than Law, 5s. a day more than Morrow and 6s. 1d. a day more than Stephenson, and if, as is probable from the data available, unsatisfactory as these are,† the consumption of fuel in the "Royal George" was less than in the other engines, he also gained in another direction. Gowland was, as he wrote in 1857, "an envied man." Robert Morrow, to whom the engine had been first offered, regretted afterwards that he had not taken it.‡

Michael Law's engine was probably the "Rocket" for, while in December, 1827, the heaviest load which he took was 44 tons, and in January, 1828, 48 tons, in February—the month when the "Rocket" started work—he was leading as much as 55 tons, 57 tons and 64 tons. He even appears to have taken down to Stockton two trains in one day, one of twenty-four, the other of sixteen waggons, containing together 106 tons. In 1826 Stephenson's and Morrow's engines were "Locomotion" and "Hope," but it is probable that, in 1828, both men were driving other engines. Classifying the engines according to their respective hauling capacities as displayed during the journey to Stockton and Yarm, we have: (1) The "Royal George,"; (2) The "Rocket"; (3) "Locomotion," "Hope," "Black Diamond," "Diligence," "Experiment"; the number of waggons taken down per trip averaging for the whole year, (1) twenty-four, (2) twenty, (3) nineteen.

The Stockton and Darlington Railway Company were able to show in 1828 from their own experience, that the use of locomotive power upon their line had been advantageous to them. They were able to point to improvements adopted in their own engines which gave promise of further benefits in the future. Even the earlier Hetton Colliery engines, the objects of unfavourable rumour, were stated this year to be doing work at an estimated expense of £1 4s. 7d. per day, which would have cost the owners £3 had they

* When engineman and fireman were thrown idle in consequence of an accident to the engine not caused by themselves, they were paid half wages if the repairs did not take more than a week to execute, and full wages if the repairs extended beyond that period; but they were required to do any other work which the Company might find for them. Sub-committee minutes, 26th January, 1827.

† *Report on the Comparative Merits of Locomotive and Fixed Engines*, pp. 21, 24.

‡ Letter by Wm. Gowland on "The Locomotive Blast Pipe." *Engineer*, 23rd October, 1857.

employed horses,* the record for one day—equal to 1,270 tons led one mile—exceeding, indeed, the average day's work of the Stockton and Darlington engines. These considerations had no doubt some weight with the majority of the directors of the Liverpool and Manchester Railway, confirming them in their opinion that locomotive engines would best answer the purposes of their railway and contributing to the decision which brought about the memorable contest at Rainhill.

Although the locomotive engine had given such satisfactory proofs of its powers, horses continued to perform part of the work of the Stockton and Darlington Railway for many years afterwards, even until 1856, on one portion of the line. How was this? They kept their place by virtue of a simple and ingenious contrivance which economised their powers to the extent of one-third. This was a kind of bogie or light truck upon four wheels, “a bare platform of boards, within a couple of feet of the ground and without side-rail or guard of any description,” according to Sir George Head who saw it a few years later.† It was at first called a horse-waggon, a horse-carriage and a horse-truck, but these names were soon superseded by the more popular ones of “dandy-cart,” “dandy-waggon,” “dandy” and “horse-dandy.”‡ The object of the truck was to enable the horse to husband its strength by riding, instead of trotting, in the rear of the loaded waggons down the many “runs” on the line.

* Letter on “Locomotive Engines,” by T.G. [? Thomas Grainger] in *Scotsman*, 4th October, 1828. The average day's work of a Hetton engine, previous to 1825, was equal to 677 tons of coals led one mile (see Wood's *Railroads*, 1st ed., pp. 281-282), and though this amount of work may have been exceeded in 1828 it would undoubtedly fall far short of 1,270 tons.

† *Home Tour*, vol. i., p. 314.

‡ *Dandy* was one of the stock epithets of the period. It was applied ironically to anything new and showy, thus:—“It has been whispered that a corps of velocipedites is about to be raised in this country, to be called *Dandy Dragoons*” (*Durham County Advertiser*, 15th May, 1819). The velocipede, just coming into fashion, was styled a “*dandy-horse*.” Some new staiths at Wallsend appear in the Keelmen's plan of the Tyne of 1828 as the “*Coxlodge Dandy Geers*”; the new Fish Market of Newcastle-upon-Tyne was the “*Dandy Fish Market*” of the song writer. The word “dandy-cart” made its appearance in the Stockton and Darlington Railway books in 1830 for the first time, so far as can be ascertained, in the following entry:—“Oct. 1st. Paid Jos. Stephenson for *Dandy Carts* per valuation £39 18s. 0d.” Daniel Adamson's account was also debited with 2s. for mileage run on the 15th November by “a *dandy-cart* from Darlington to Shildon.” It first received official recognition on the 29th of April, 1831, when the sub-committee adopted the following regulation:—“All horses to have *Dandy-carts* or a reasonable time allowed to provide the same.” The name afterwards came to be applied to a railway carriage drawn by a horse. For instance, the carriage reserved for the Duke of Wellington, when Lord Warden of the Cinque Ports, still preserved by the South Eastern and Chatham Railway Company, was called a “dandy” coach. Passengers were conveyed until the 4th of July, 1881, from Milton, now Brampton, station to the Sands near the town of Brampton in a “dandy,” and until April 4th, 1914, a “dandy” ran between Drumburgh station and Port Carlisle on a part of the North British Railway system.

The plan was adopted at the suggestion of Thomas Shaw Brandreth, a scholarly barrister, of Liverpool, with a turn for mechanical invention, but the originator of it was George Stephenson, who did not view with equanimity this appropriation of his ideas. His sensitiveness on the point comes out in a letter addressed to Timothy Hackworth on the 25th of July, 1828: "It appears," he wrote, "Brandreth has got my plan introduced for the horses to ride, which, I suppose, he will set off as his own invention. It is more than two years since I explained this to Brandreth. Canterbury was the place where I meant to have put it to use, but, as that Company have now determined to work the line by steam power, it will not be wanted," and, reverting to the matter in a postscript, he added: "John Dixon and every director at Canterbury can speak to my plan of carrying the horses which I mentioned to them two years ago, but I never considered it ought to be tried at Darlington, as there I considered the locomotive engine a better thing."*

The dandy-cart was tried on the line in either June or July, 1828, and its advantages were at once apparent—especially to the four-footed servants of the Company. Previous to this time, they were much shaken in following the waggons down the "runs," and more fatigued than by going the same distance at the same rate with a load. It had been found necessary in consequence to employ light horses of little power, ill-suited to the rest of the work.†

A horse was not long in learning how to get on to the dandy-cart, even when it was in motion, after he had once grasped the agreeable fact that there was a basket of hay at the end of it. When unhitched near a "run," he would allow the waggons to pass him and, trotting after the train, leap on to the low truck of his own accord, performing the feat not only without urging, but, on the contrary, with so much eagerness as to render it difficult to keep him off. As if conscious that his position on the truck was not without danger in the event of a sudden stop, he prepared for such a contingency by resting continuously on his haunches.‡ At the bottom of a "run," he would get down of his own accord as nimbly as he got up, and resume pulling with fresh vigour.§

* From the original letter in the possession of the New Shildon Mechanics' Institution.

† *Liverpool Mercury*, 18th July, 1828, paragraph, "Improvement on the Darlington Rail Road."

‡ Sir George Head's *Home Tour*, vol i., p. 314.

§ *Newcastle Chronicle*, 29th September, 1875, article, "First Engine Drivers."

The evident satisfaction of the horse with this mode of conveyance did not escape observation. When the men were asked if the horses liked this sort of treatment, the reply was that they fairly "laughed again." "You would hardly believe it," said one of the men, "but there and then, one day I had not the bogie, and the horse was trying to get into a chaldron waggon."*

Before the introduction of the dandy-cart, a horse travelled in the course of a week of six days: 87 miles down the line, with a load of $17\frac{1}{2}$ tons (coals 12 tons, waggons $5\frac{1}{2}$ tons); 87 miles up the line, with a load of $5\frac{1}{2}$ tons (empty waggons); total, 174 miles. After the dandy-cart came into use the distance covered in a week was increased to 120 miles down the line, with the same load as above; 120 miles, up the line, with the same load as above; total, 240 miles. The horse was improved in condition, instead of growing worse in condition, as formerly.†

A horse taking his usual load to Stockton—four waggons, each containing a Newcastle chaldron, or rather more—got into his dandy-cart at New Shildon, and was carried with the train by the force of gravity to the bottom of Simpasture, a distance of 3 miles. Here his services were required to haul the waggons over what was known as "Aycliffe Level," though really a plane descending at the rate of 1 in 528. Mounting his carriage again near Aycliffe Lane, while it was still in motion, he rode straightway to Darlington. From Darlington he pulled the waggons to Fighting Cocks, a stretch of 3 miles, when the power of gravity, once more coming into operation, relieved him from his task, and he was able to travel at ease for the next 2 miles. At Goosepool, he resumed work, drawing his load along another short stage of 2 miles to Urray Nook, from which place to Stockton he had nothing to do but make himself better acquainted with the contents of his manger. So, refreshed and "fit," he was ready for the upward journey.

Besides benefiting the horses and increasing their usefulness, the dandy-cart enabled the drivers to give greater velocity to the descending waggons which, by the impetus acquired, ran further along the level, or nearly level, ground, and there was consequently a saving both of time and hauling-power. Moreover, the labour of the way-men was a good deal lightened by the removal of the horses from those parts of the road where the waggons would run by themselves.

The advantages of the dandy-cart were obvious enough, yet, several months after its introduction, many of the horses on the line, owing to the

* Speech by Henry Pease at Railway Jubilee Celebration. *Railway News*, 2nd October, 1875.

† Wood's *Treatise on Railroads*, 1831 ed., p. 303.

prejudice or apathy of the leaders, were still trotting down the inclines and doing their 174 instead of 240 miles a week. In consequence of this want of enterprise, or reluctance to adopt improvements, it was ordered on the 7th of November, 1828, "that every horse-leader of coals shall immediately provide himself with trucks for carrying the horse down the descending part of the line, as no encouragement of any description will be given to any leader who does not provide this accommodation."* The cost of a dandy-cart was as follows:—

	£	s.	d.
Woodwork	3	15	0
Ironwork	1	16	0
Wheels (4) 1 cwt. 2 qrs. 12 lbs. @ 10s.	16	1	
Bearings	2	8½	
	6	9	9½†

and there may have been a disinclination to incur this preliminary expense. The directors, therefore, decided to offer an inducement. They advanced the price to leaders of coal to Stockton, 1d. per ton for three months from the 1st of December, but conditionally—this price was only to be paid to those who furnished themselves with trucks.‡ Naturally, the dandy-cart soon afterwards came into general use on the line, and from this time until the year 1856, was one of the curiosities of the Stockton and Darlington Railway.

This plan of increasing the work performed by the horses was not long confined to South Durham. It was shortly afterwards introduced on the Mauch Chunk Railway, between the mining town of Summit Hill and the right bank of the Lehigh River, in the state of Pennsylvania, U.S.;§ on

* Sub-committee minutes, 7th November, 1828.

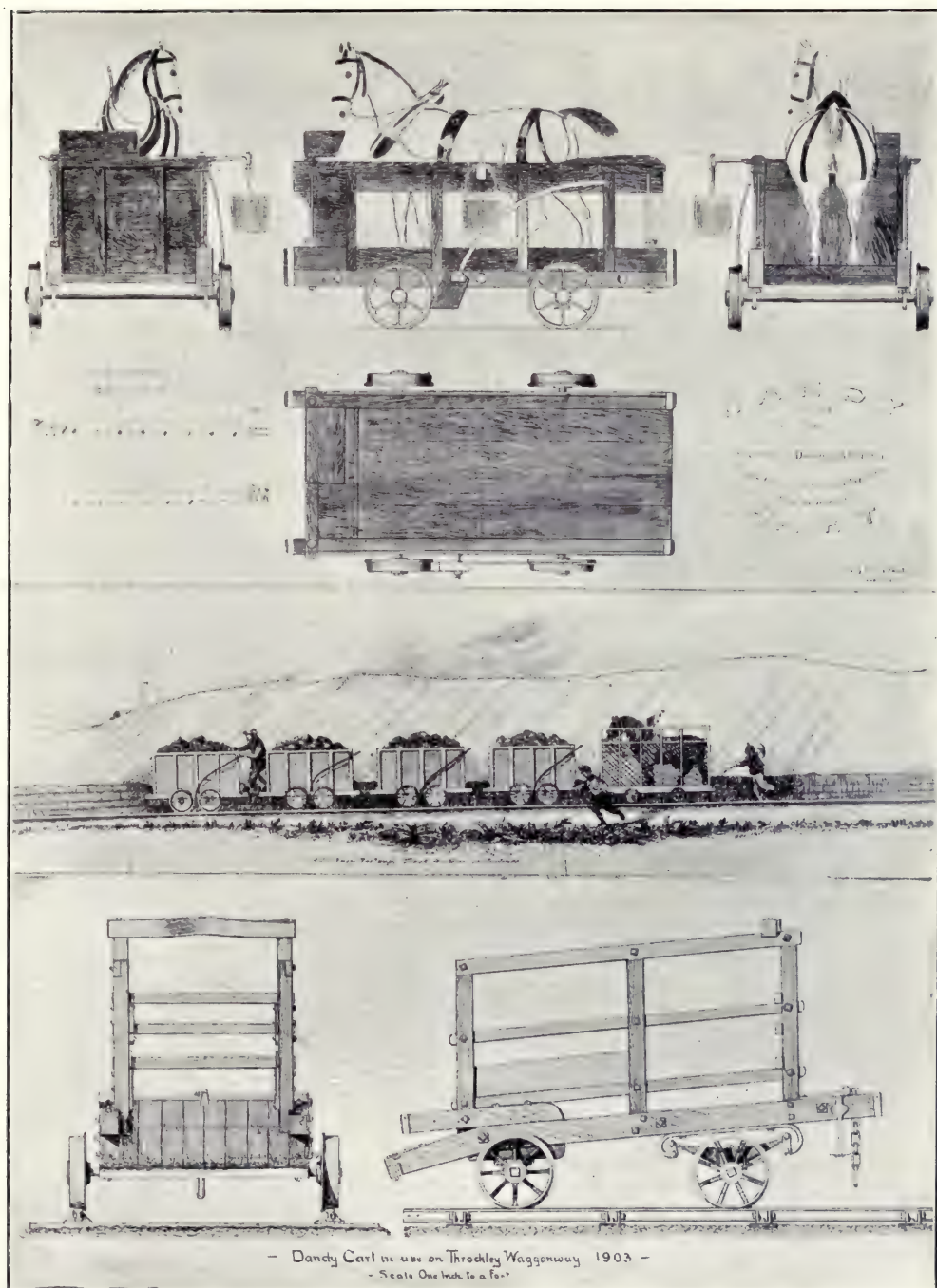
† The cost of trucks supplied to Charles Law and John Coates in August, 1882.

‡ Sub-committee minutes, 28th November, 1828.

§ According to Mr. George Buchanan (*Account of the Lanarkshire Railways*, 1832), this plan was first practised on the Mauch Chunk Railway. In that case, it must have been introduced between May, 1827, when the railway was opened, and June, 1828, when the first horse-carriage was placed on the Stockton and Darlington Railway, but of this there is not the slightest evidence. Some interesting notes of a journey to the coal-bearing regions of Pennsylvania, in May, 1830, by Benjamin Silliman, M.D., LL.D., enable us to compare the working of the dandy cart on lines so far apart as the Stockton and Darlington Railway and the Mauch Chunk Railway:—

"The empty waggons are drawn back by mules, fourteen waggons to eight mules; twenty-eight mules draw up forty-two coal and seven *mule waggons*, and the arrangement is so made that the ascending parties shall arrive in due season at the proper places for turning out. . . .

The mules ride down the railway; they are furnished with provender placed in proper



DANDY CART ON STOCKTON AND DARLINGTON RAILWAY, BALLOCHNEY RAILWAY AND THROCKLEY WAGGONWAY.

the Ballochney Railway, Lanarkshire, N.B. (opened 8th August, 1828), and later, on the Festiniog Railway, North Wales; on the Clarence Railway and on many private mineral lines. The dandy-cart was employed on the Festiniog Railway until the year 1863,* and on the Throckley waggonway, near Newburn, a few miles west of Newcastle-upon-Tyne, until the year 1907. It will be observed from the illustrations on the preceding page, that the form of the dandy-cart varied according to locality. The Stockton and Darlington example, from a sketch by the late Mr. George Graham, is evidently later in date than 1835, for the dandy-cart seen by Sir George Head in that year was without side-rails.

While the Stockton and Darlington Railway Company were thus increasing the efficiency of the several forms of motive power employed on their line, they were also engaged in experiments for diminishing the resistance to the motion of waggons. From September, 1826, they had been testing a waggon constructed after Mr. Brandreth's patent (No. 5,281, 8th Nov., 1825)† which, by the introduction of anti-friction rollers, was designed to convert the rubbing or sliding motion of the axles into a rolling one. Its superiority to the older waggons as a runner was proved in a trial of speed which took place on the 11th of September, 1826, when it rapidly outstripped its competitor, being at the third quarter-mile post as soon as the other had reached the second.‡ Some of these patent "friction" waggons, as they were called, constructed to carry about 4 tons, were purchased in December, 1827. Still pursuing their experiments, the Company ordered from Messrs. R. Stephenson & Co., a waggon mounted on springs which was sent from

mangers, four of them being enclosed in one pen mounted on wheels, and seven of these cars are connected into one group, so that twenty-eight mules constitute the party, which, with their heads all directed down the mountain, and apparently surveying its fine landscapes, are seen moving rapidly down the inclined plane with a ludicrous gravity, which, when observed for the first time, proves too much for the severest muscles.

They readily perform their duty of drawing up the empty cars, but having once experienced the comfort of riding down, they appear to regard it as a right, and neither mild nor severe measures, not even the sharpest whipping, can ever induce them to descend in any other way." "Notes on a journey from New Haven, Conn., to Mauch Chunk and other anthracite regions of Pennsylvania." *The American Journal of Science and Arts*, vol. xix., 1831, p. 15.

It appears from a brief *History of the Lehigh Coal and Navigation Co.*, published in 1840, for a reference to which the present writer is indebted to Mr. Charles H. Fry, the courteous editor of the *Railroad Gazette*, that the arrangement enabled the mules to make two-and-a-half trips to the summit and back, thus travelling about forty miles each day.

* Paper on the Festiniog Railway, by Captain H. W. Tyler. Institution of Civil Engineers *Minutes of Proceedings*, vol. xxiv., p. 360.

† For diagrams of this waggon see Hebert's *Encyclopedia*, vol. ii., p. 476.

‡ *Liverpool Mercury*, 15th September, 1826, paragraph, "Important improvement in carriages."

Newcastle on the 27th of November, 1828.* And thus was introduced on the Stockton and Darlington Railway the type of waggon which was adopted two years later by the directors of the Liverpool and Manchester Railway after various trials with the respective friction waggons of Brandreth and Winans, and eventually came into general use.

At this early period, while the Stockton and Darlington Railway enjoyed the distinction of being "the great theatre of practical operations on railways," the office of the Company was a veritable bureau of information. Neither the directors nor the agents, according to Mr. Walker's report, "appeared to have any object in view but to advance the prosperity and usefulness of their concern, and to extend the results of their experience for the information of others."† Not only did they receive deputations from important railway committees and explain the features of their line and rolling-stock to engineering visitors, but they courteously answered inquiries from various parts of the country. The Ballochney Railway Company, for example, had commenced running, on the 8th of July, 1828, a springless coach with accommodation for thirty passengers, between Airdrie and Kirkintilloch, and were called upon to pay government duty at the rate of 3d. per mile. Not having any other means of informing themselves on the subject, to whom else could they come, in this difficulty, but to the Stockton and Darlington Railway Company?‡ The Dundee and Newtyle Railway Company wanted a drawing of a "cowping" waggon. Would the Stockton and Darlington Railway Company supply them with one? They had heard of a new method of fastening rails to the chairs by means of keys. What was the opinion of the Stockton and Darlington Railway Company with regard to it?§ Such were the questions addressed to the Company with ever-increasing frequency, until, a few years later, the directors, looking at the fact that "numerous applications continued to be made from time to time from different public companies and individuals of the highest respectability, requesting details of information, opinions, statistics, plans, copies of Acts of Parliament, and finding that the office had been stripped of all the valuable documents of this nature," passed, in self-defence, the following resolution:—"That in future such applications be referred to the Company's

* R. Stephenson & Co. to the Stockton and Darlington Railway Company, 27th November, 1828. N.E.R. Muniments.

† *Report on the Comparative Merits of Locomotive and Fixed Engines*, 1829, p. 3.

‡ Thomas Grahame to the Darlington Railway Company, 18th July, 1828. N.E.R. Muniments.

§ C. Landale to Joseph Pease, 13th January, 1827. N.E.R. Muniments.

engineer, and he is at liberty to give such answers to the same as he may consider proper, having regard to his own professional standing and pecuniary interest, in all matters in which this Company is not concerned.”*

On the lines brought into service during this early experimental period, on the railways in progress and nearing completion, on the projects awaiting Parliamentary sanction, the influence of the Stockton and Darlington Railway was continuously felt. With some of these undertakings the Stockton and Darlington Railway cannot, of course, be compared in importance; its works were constructed on a less magnificent scale; the rôle which it played was confined to a very much smaller stage; the range of its economic action was necessarily more limited, but this has been said of it, and this is its claim to the gratitude of posterity, “it was the first railway which really showed how much between two towns, the personal intercourse of which was trifling, facile and cheap communication would increase that intercourse.”†



SEAL OF CLARENCE RAILWAY COMPANY.

* Committee minutes, 5th September, 1834.

† John Francis, *A History of the English Railway*, 1851, p. 55.

CHAPTER V.

THE BEGINNING OF RAILWAY COMPETITION.

[1828-1830.]

Encouraged by the example of the Stockton and Darlington Company, whose pioneering mission was by this time accomplished, other railway companies were preparing to take part in the great work of improving the means of transport in the country.

The railway movement, so far as the north of England was concerned, was for many years a movement from west to east, from the mineral districts of Durham and the towns of Leeds and Carlisle towards the sea. None of the projects for lines running south and north got so far as the precincts of the House of Commons. The scheme, to which reference has already been made (p. 97), for a line of railway communication between London and Edinburgh, passing through the counties of Yorkshire, Durham and Northumberland, was too comprehensive for the time. It was recognised that, however desirable such a line might be, the scheme was too colossal to be carried out in its entirety. A more moderate proposal, brought forward soon after the opening of the Stockton and Darlington Railway—to make a railway from Selby to York and thence through the vale of York to Newcastle with a branch to Sunderland, on which goods were to be conveyed for 3d. per ton per mile, at a speed of 6 miles an hour—met with an equally lukewarm reception. It was indeed foredoomed to failure, as the promoters, in order to avoid an application to Parliament, proposed to carry the line from the Ouse to the Tyne by means of wayleave agreements, offering the landowners double the annual value of the land for the first twenty years from breaking the ground, treble its annual value for the next twenty years and quadruple its annual value for ever afterwards, besides limiting the Company to certain fixed charges.*

A resolution to dissolve the London Northern Rail Road Company having been lost at a meeting held on the 17th of August, 1826,† the Company decided in December to open new subscription books and issue a second

* *Durham County Advertiser*, 25th November, 1825; *Gentleman's Magazine*, December, 1825, p. 638.

† *Tyne Mercury*, 29th August, 1826.

prospectus.* Some of the inhabitants of York began to realise that there was a possibility of their city being left at a distance by the great trunk line which, sooner or later, would connect London with Edinburgh, and that the traffic flowing through it might be diverted into another channel. On the 30th of December, 1826, there appeared in the *York Herald* a suggestion that a line should be made from the termination of the Stockton and Darlington Railway at Croft Bridge to the city of York by way of Northallerton, Sand Hutton and Easingwold. On the ground of mutual interest and expediency, such a line, it was conceived, would inevitably form part of the prospective communication. "A Practical Farmer," in a pamphlet issued the following month (January, 1827),† enlarged upon the advantages of the railway in lowering the price of fuel and facilitating the transport of lime; pointing out, among other things, that if, as a probable result of the proposed alteration in the Corn Laws, the landowners and farmers of the North Riding should be injured by foreign importation, the railway would afford them a direct and cheap conveyance of their corn, etc., to an inland or home, instead of to an out-port, market. The city of York, it was affirmed, would become, what it had been in the past, the great mart or station for the agricultural produce and merchandise of the county. Ripon also would be benefited by the influx of Cleveland grain into its market, which was in no danger of being overstocked, for, so favourable was the situation of the numerous corn and shelling mills in the town and elsewhere along and beyond the line, that their flour and meal, in whatever quantities produced, would always be disposed of to advantage in the manufacturing districts of the West Riding and Lancashire.

Following on the heels of "A Practical Farmer" came John Pemberton, barrister-at-law, Bootham, York, the originator of the Selby to Newcastle scheme, with a pamphlet‡ advocating the construction of a line between the Stockton and Darlington Railway and York, crossing the Tees at either Sockburn or Middleton, and passing by Northallerton, Thirsk and Easing-

* *Scotsman*, 13th December, 1826.

† *Observations on the Practicability and Advantage of the Continuation of the Stockton and Darlington Railway from Croft Bridge to the City of York, and by means of Collateral Branches to effect a speedy, cheap, and direct communication between the Counties of Northumberland and Durham, the Ports of Newcastle and Stockton, and the Agricultural Districts of the North Riding of Yorkshire, and the Manufacturing and Commercial Districts of Yorkshire and Lancashire, etc.* Ripon, 1827.

‡ *Address to the County of York respecting the formation of a Railway Company, and the making a Railway from York to the Darlington Railway with a Branch to Ripon, and the Rules of such Company.* By John Pemberton, Esq., barrister-at-law, York, 1827.

wold, with a branch therefrom to Ripon. He recommended that a company should be formed, under the title of "The Yorkshire Railway Company," to carry out this object. The capital was to be raised in a novel fashion, by means of weekly contributions extending over a period of ten years, payable one week in advance from the 1st of May, 1827. There were to be three classes of proprietors: (1) Those paying less than 10s. a week, who were not to have any voice in the affairs of the Company; (2) those paying over 10s. a week and less than £5, who were to have a vote for every weekly contribution of 10s., but were not eligible for election as directors; (3) those paying £5 a week and upwards, who were to have a vote for every weekly contribution of 10s., and were eligible for election as directors.

The shareholders of the first and second classes, being members of one family or residing in any particular town, village or neighbourhood, were to be permitted to unite their contributions, and elect one of their number to collect the several sums and pay them over to the Company. The representatives of the first class were to have the right of voting for every weekly contribution of 10s. at all meetings of the Company, and those of the second class were to be entitled to all the privileges of the third class for the benefit of their associates.

Shareholders neglecting to make their weekly payments at the proper time were to forfeit their prior payments and all interest in, and control over, the Company's concerns, unless such weekly contributions should be paid up, with 10 per cent. interest on the arrears, within the space of twelve months. The Directors were to have the power to make wayleave agreements with the landowners through whose estates the proposed railway was to pass, exactly similar to those which had been proposed in connection with the Selby to Newcastle railway. The time, however, had not come for the promotion of the great north line, and the project fell through.

The second railway that obtained parliamentary sanction in the north-eastern portion of England was the outcome of competition rather than of emulation.

Shortly after the Honourable Archibald Cochrane & Company had reached the Main and Hutton seams at Hetton, the one at a depth of 649 feet and the other at a depth of 882 feet, confuting the general opinion among geologists and mining engineers that coal, if it existed at all beneath the magnesian limestone, would be found deteriorated in quality and diminished in thickness, there was a great deal of sinking and boring in that part of the Durham coal-field lying to the east and south-east of the

Wear, from Sunderland Bridge downwards. This new and important development, which led Mr. Arthur Mowbray in 1823 to put forward a project for working the coal in the Elemore and Haswell estates, and conveying it for shipment to Hartlepool by means of a railway on the wayleave principle,* also brought into prominence the value of the Coxhoe and Quarrington collieries, leased from the Bishop of Durham by the three unmarried daughters of General Hale. Coxhoe, in consequence, became one of the railway objective-points of the county of Durham. The Stockton and Darlington Railway Company, it has already been stated, entered into an agreement, in 1821, with the Misses Hale for the purchase of the collieries, and had the arbitrators appointed to act for the contracting parties been able to come to a decision regarding the price, a branch of the Stockton and Darlington Railway would no doubt have been thrown out in the direction of Coxhoe, and a regrettable chapter in railway history, in which these collieries reappear in association with a great, but unhappy, figure, the founder of West Hartlepool, would not have had to be written.

It was chiefly for the purpose of conveying coals from these collieries to Stockton and the western parts of the county of Durham that the Tees and Weardale Railway had been planned in 1823, and when, after the defeat of that measure in 1825, William Hedley, one of the pioneers of steam locomotion, took a royalty in the district and won a colliery at Crowtrees, on the margin of the limestone,† the expediency of carrying a railway from Stockton to Coxhoe was more than ever apparent.

In Weardale, also, within a mile of the proposed terminus of the railway, borings had been made in the estate of Charles Lyon,‡ during the autumn of 1824, with results which justified the expectations formed by the leaders of the Tees and Weardale party. Rumours of a projected line from Weardale to the Stockton and Darlington Railway were current in November, 1825, and it was stated that, if the Darlington Company were not prepared to make it, the lessee of the royalty—William Russell, of Brancepeth Castle (who had supported the Tees and Weardale scheme in 1824 and opposed it in 1825)—would lay the line at his own expense.§

While the promoters of the Tees and Weardale Railway were waiting for the propitious moment to renew their application to Parliament for an Act, the Stockton and Darlington Railway Company were demonstrating the

* Sir C. Sharp's *History of Hartlepool*, Supplement, 1851, p. 4.

† O. D. Hedley, *Who invented the Locomotive Engine?* 1858, p. 83.

‡ *Durham County Advertiser*, 2nd October, 1824. § *Tyne Mercury*, 29th November, 1825.

correctness of these gentlemen's conclusions: that an extensive export trade from the Tees was practicable, and that to engage profitably in such a trade the railway would have to be carried to deep water.

As the export trade increased, it became more and more evident how unsuitable was the position of the coal-shipping staiths at Stockton. The channel of the river from Newport upwards was beset with shoals, the worst of which was situated a little below the town at Jenny Mills' Island. This shoal was the measure of the available depth of water to the town. As many as six and eight ships together were sometimes aground on it. The only vessels that could navigate the river were those of small tonnage, drawing 7 or 8 feet at an average tide, and 11 feet at a spring tide. If of more than 100 tons burden, they could seldom get away from the staiths with the whole of their cargo; the remainder, in keel or in billyboy followed them to Middlesbrough, and there it was taken on board. They were frequently neaped at the berths and detained for some days, preventing other ships from getting all or part of their loading.* There was no provision for storing the coals as they came from the pits, as in the older staiths of the Tyne and Wear, consequently, when vessels were unable to get up the river to load, the traffic from one end of the line to the other was disorganised. "By detention of waggons and engines," reported Mr. Storey on the 26th February, 1826, "we only got two sets of waggons over Brusselton Inclined Plane yesterday, which is doing worse than lying idle."† As early as this date the Company had apparently looked to Haverton Hill as a more convenient place of shipment than Stockton, and it was not long before a scheme for a branch line from Stockton to that locality was under consideration.

An alternative scheme was very astutely brought before the notice of some of the directors by Henry Blanshard, one of the leading promoters of the Tees and Weardale line, who, if not actually treating with the Misses Hale at this time for the purchase of their lease of Coxhoe colliery, had probably such a negotiation in view. After pointing out that the revival of the northern line might be contemplated, not only as possible but even as probable, he submitted whether, supposing that running powers could be obtained, it would not be more to the interests of the Stockton and Darlington Railway Company to form a connecting link of 6 miles between Simpasture and Elstob, and take their coals for exportation down part of the

* *Minutes of Evidence on Stockton and Darlington Railway Bill*, 1828, pp. 79, 80, 82, 103, 181. *Fragments of the Early History of the Tees*, by William Fallows, 1878, p. 14.

† Thomas Storey to the Committee, 26th February, 1826. N.E.R. Muniments.

northern line, than to make an independent line of their own from either Simpasture or Stockton to Haverton Hill.* His object was to prepare the way for the making of a definite proposal to the Company. The promoters of the Tees and Weardale Railway built great hopes on a remark by Mr. Backhouse that such an arrangement (which would avert the hostility and secure the co-operation of their most active opponents) might be entertained, and a compromise effected, on the basis suggested. Christopher Tennant laid stress on the importance of taking the measure through Parliament "when Lambton was out of the Kingdom." "If," he added, "the Company should not find it convenient to raise the money, the efforts of the Northern Railway party combined with theirs would do so."† But his advances were repelled. To a definite proposal for a union of views and interests which he made to the Committee, agreeably to a suggestion "from a very high quarter" (presumably from Mr. Blanshard), he was "uncourteously informed by letter there was no answer."‡ The Stockton and Darlington Railway Company had already decided to make a branch line from a point about one mile out of Stockton to the river Tees near Haverton Hill, and they proceeded to give the usual Parliamentary notice, which was dated the 16th of October, 1826.§ Their scheme, however, was not sufficiently matured, and, in accordance with a resolution of the 24th of November, no plans were deposited.|| On the 5th of January, 1827, it was decided that the Bill should be brought before Parliament in the session of 1828.¶

When the shareholders came together at their annual meeting on the 10th of July, 1827, they were in possession of a plan and survey of the proposed branch line to Haverton Hill, and also of a plan and survey of another line, on the opposite side of the Tees, to Middlesbrough, in the North Riding of Yorkshire which, with equal advantages, was both shorter and less expensive than the other, the saving in distance being nearly two miles and the saving in cost about £1,000.**

Recommended by Thomas Storey, the engineer, who, with Richard Otley, the secretary, had made both surveys, the new line met with general

* Henry Blanshard to Thomas Richardson, 11th June, 1826. N.E.R. Muniments.

† Christopher Tennant to Richard Otley, 8th September, 1826. N.E.R. Muniments.

‡ Letter by Christopher Tennant in *Durham County Advertiser*, 19th January, 1828.

§ *Durham County Advertiser*, 21st October, 1826.

|| *Minutes of Shareholders' Meetings*, 24th November, 1826.

¶ *Ibid.*, 5th January, 1827.

** *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, p. 177.

approval. George Stephenson, who was afterwards asked to examine it, went over the ground in the beginning of September, and his report was presented and read at a meeting held on the 22nd.* As the line pointed out by him appeared to come too near to Stockton bridge, Thomas Storey was directed to consider whether the Tees could not be crossed a little further to the south.† The plan of a second line was then submitted, branching off at Whiteley Springs, at or near the 3-mile post from Stockton. It was not, however, adopted, being two miles and a quarter longer, and estimated to cost £12,000 more, than the other.

A general meeting was called for the 19th of October, when it was definitely resolved to extend the railway to Middlesbrough—a decision ratified by the whole of the shareholders on the 26th.‡ Christopher Tennant, recognising that this decision closed the door to further negotiations, now brought forward his revised scheme for a railway the object of which was to convey coals for shipment to Haverton Hill. As this railway did not go into Weardale, the old title was inappropriate, and it was necessary to find another. From a regard for the profession which he had followed in early life as a sailor; Christopher Tennant, therefore, called the new railway after the Duke of Clarence, who was then, and until elevated to the throne as William the Fourth, Lord High Admiral of the British Navy.§

The Tees and Weardale Railway of 1824-1825 did not touch the Stockton and Darlington Railway at any point, it did not even go near the great Auckland coal-field: its avowed object was to convey coals for exportation from the Coxhoe district, but now, as the Stockton and Darlington Railway Company would not join hands with them, the promoters of the Clarence Railway resolved to take their line right up to Simpasture, not only for the purpose of diverting some of the Auckland traffic from that point to Haverton Hill, but, by means of a short branch into the Deanery estate, of invading the Auckland coal-field itself. By means of another short branch to Brown's Bridge, near Stockton (a quarter of a mile to the north-west of the present railway station in Bishopton Road), they proposed to compete for the landsale trade of that town and East Cleveland.

A comparison between the two lines to Stockton and the respective places of shipment showed that the Clarence Railway Company could compete with their rivals under very favourable conditions:—

* *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, p. 10.

† *Ibid.*

‡ *Ibid.*, p. 11.

§ Letter by Christopher Tennant in *Durham County Advertiser*, 19th January, 1828.

Distance from Simpasture, near School Aycliffe, to Stockton by the Stockton and Darlington Railway	17½ miles.
Distance from Simpasture by the Clarence Railway	11½ „
(Being a saving of 6 miles, or rather more than one-third of the distance.)	
Distance from Simpasture to Middlesbrough, the place of shipment of the Stockton and Darlington Railway Company	21½ „
Distance from Simpasture to Haverton Hill, the place of shipment of the Clarence Railway Company	14 „
(Being a saving of 7½ miles, upwards of one-third of the distance.)*	

To all intents and purposes the Clarence Railway was the Northern Railway of 1819, and the promotion of it, after the arrangement which had been concluded in that year, was angrily resented in Darlington as an act of bad faith. “War, therefore, open or conceal’d” was decreed by the Quaker board against the offending company, and subsequent pages will show how relentlessly it was waged.

The resolution of the Stockton and Darlington Railway Company to extend their line to Middlesbrough roused into action the Tees Navigation Company, who had a melancholy vision of deserted quays and wharves and a consequent loss of dues. Since 1813 the trade of the port of Stockton had not increased except by means of the railway. Had it not been for the amount paid on coals, viz., £306, the receipts of the Tees Navigation Company for 1827 would have shown a decrease of £136 when compared with those of 1813.† As early as November, 1825, the Tees Navigation Company had given notice of their intention to apply for powers to improve the navigation by making a canal or cut between Blue House Point and Cargo Fleet, but they could not raise money for the purpose and the project dropped. It was in consequence of the failure of this scheme that the Railway Company took into consideration the expediency of going to Haverton Hill.‡ The Tees Navigation Company now revived the project of a second cut, but, instead of making it right through to Cargo Fleet, they proposed to stop short at Newport. Notice was given in the same newspaper on the same

* Letter by Christopher Tennant in *Durham County Advertiser*, 19th January, 1828.

† *A Plain Statement of Facts relative to the Proposed Alterations in the River Tees*, 1828.

‡ *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, p. 217.

date* of the three schemes affecting the trade of the Tees which the Legislature was to be asked to sanction in the Session of 1828. The preliminaries were thus arranged of a parliamentary encounter, somewhat on the principle of the "three-cornered duel" of Marryat's novel, two of the combatants in this instance, however, to fire at the third who had a quarrel with only one of them.

The month of January, 1828, was a period of excitement on the banks of the Tees and Skerne. On the 4th, the Tees Navigation Company, who had consulted Robert Stevenson, of Edinburgh, on the subject of the improvement of the river, resolved to carry his plan into execution at an estimated cost of £21,181 1s. 3d., the money to be raised by creating 250 shares of £50 each, and borrowing the rest.† On the 5th, the proprietors of the Stockton and Darlington Railway met at Darlington to consider the draft of the proposed bill. A letter from George Stephenson was read stating that the improvements intended to be made in the navigation of the Tees would answer all the purposes of the Company.‡ A few of the shareholders were of the same opinion, and they proposed that the application to Parliament should be deferred until the results of the contemplated improvement should be seen. A motion to this effect having been negatived, Edward Pease moved, and Jonathan Backhouse seconded, a resolution authorising the solicitor to proceed with the measure, and directing the Committee to enter into such arrangements with the Tees Navigation Company as would conduce to the maintenance of good relations with that body, and, at the same time, promote the interests of the Railway Company; these arrangements being made on the understanding that the new line was to be confined to the carriage downwards of coal, lime and stone, and the carriage either upwards or downwards of manure, and of materials—the property of the Railway Company.§

Mr. Meynell, who signed the minutes as chairman of the meeting, expressed a wish in writing that his dissent from this resolution should be recorded and, at an adjourned meeting on the 12th, tendered a further protest in the following terms:—

"I dissent because, first, I consider the extension of the railway beyond Stockton to be a measure solely calculated to promote

* *Durham County Advertiser*, 10th November, 1827.

† Richmond, *Local Records of Stockton*, p. 152.

‡ *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, p. 204.

§ *Ibid.*, pp. 21-22.

the export of coal, and beyond the limits of the original proposal on the faith of which the subscribers agreed to take their shares; secondly, that another project, calculated to facilitate the coal trade of the port of Stockton, being decided upon, if the sanction of Parliament can be obtained, I deem the investment of £35,000 to be a precipitate expenditure of the funds of the Railway Company.”*

The defection of the chairman, with such influential members of the Company as Leonard Raisbeck, Benjamin Flounders, Richard Blanshard, Richard Jackson and John Wilkinson, who had all approved of the extension to Middlesbrough on the 26th of October, 1827, was an unfortunate incident, imperilling, at a critical juncture, the prospects of the bill.

On the 19th of January, Christopher Tennant, having made in company with an engineer whom he had employed—Edward Steel, one of Stephenson’s early assistants—a regular survey, occupying eighty days, of the country between Stockton and Coxhoe, published a glowing address to the “nobility, gentry, clergy, freeholders, merchants and others” of the County of Durham and Cleveland in the County of York on the merits of the Clarence Railway now fully matured.†

While the promoters anticipated a great deal of opposition from the fact that their engineer had not been allowed to enter the estates of William Russell, Richard Wright and Robert Surtees‡—petitioners against the Tees and Weardale Bill of 1825—they were sanguine as to their prospects of success, for Henry Blanshard of London, having failed in conjunction with William Aldam of Leeds and Mr. Pease to form a company for the purpose,§ had purchased the lease of Coxhoe Colliery from the Misses Hale, giving, according to the Marquis of Londonderry, an enormous price for it on the condition that they should use their best efforts to procure the passing of a railway bill,|| these ladies, by reason of their numerous family connections, possessing considerable influence.

A diversion in favour of the Stockton and Darlington Railway Company was created by some coalowners and others interested in the trade of the Tees who met at Darlington on the 6th of February and passed a series of resolutions, afterwards printed and circulated, inimical to the measure of the

* *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, p. 218.

† *Durham County Advertiser*, 19th January, 1828.

‡ *Minutes of Evidence on the Clarence Railway Bill*, 1829, p. 50. § *Ibid.*, p. 134.

|| Speech in the House of Lords, 20th May, 1828, *Northern Year Book*, 1829, p. 99.

Tees Navigation Company. By means of these resolutions they gave publicity to their opinion that the dues which the Navigation Company had power to levy on every vessel entering the Tees, whether it made use of the Cut or not, would be perpetuated, if not increased, and they called upon the merchants, manufacturers, coalowners and agriculturists of the district to resist what they considered to be the imposition of an unjust tax upon them.*

To meet this opposition, the Mayor of Stockton called the inhabitants of the town together on the 12th of February, when resolutions approving of the Tees Navigation Company's scheme, and authorising the preparation of petitions to Parliament in favour of it were passed unanimously, these being proposed and seconded by shareholders of the Stockton and Darlington Railway, viz.: (1) Thomas Meynell and William Skinner; (2) Benjamin Flounders and Richard Jackson.†

At another town's meeting on the 14th of April, over which the Mayor again presided, it was agreed to support the Clarence Railway Bill and forward petitions in favour of it to both Houses of Parliament; the promoters having pledged themselves to alter and extend the branch then intended to terminate at Brown's Bridge so that it should pass by the north-east end of the town to the river Tees.‡

The only opposition which the Tees Navigation Company and the promoters of the Clarence Railway had to fear was from without. In the case of the Stockton and Darlington Railway Company it was different. They had opponents within their own ranks whom it was necessary to propitiate. The Rev. William Luke Prattman insisted that he must have some security for the completion of the Hagger Leases branch or he would be obliged to come to Parliament and seek redress, and, after a good deal of negotiation, it was agreed that the Company should insert in their bill a clause making it compulsory upon them to complete this branch within a given time.§

Leonard Raisbeck, the Recorder of the Stockton Corporation, who had been one of the first to advocate and support the establishment of a railway in the district, opposed the measure on other than personal grounds. He considered that the branch to Middlesbrough would prejudice the interests not only of the townsfolk in general, but of some of his own friends in particular, and he felt he could no longer aid in the progress of the bill. He therefore resigned his position as one of the solicitors, though remaining a shareholder,

* *Plain Statement of Facts relative to the Proposed Alterations in the River Tees*, 1828.

† *Durham County Advertiser*, 16th February, 1828.

‡ *Ibid.*, 19th April, 1828.

§ *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, p. 16.

of the Company.* Mr. Meynell, having land near the river opposite to Cottage Row, called the Carrs—the race-course was on part of it—contended that he ought to have secured to him without any expense, if required, a power of communicating by branch with the railway.† This claim not being admitted, he proceeded to petition against the bill—an example followed by the other dissentients, who took up this position: That the application of the corporate funds to the formation of the new branch projected by the bill was not within the objects for which the Company was incorporated, and, consequently, that the act of the Corporation consenting to such an application could not bind the shareholders who dissented.‡

The bill passed, without particular obstruction, through the House of Commons, and was read a third time on the 1st of April; but it met with violent opposition in its progress through the House of Lords. The coal-owners of the Tyne and Wear, who had been caught napping in 1821, were now wide awake to the danger of the Tees competition, and they banded their forces together to prevent the continuation of the railway to deep water. Having themselves to pay heavy wayleave rents, they contended that the legislature, in sanctioning a public railroad for the conveyance of coals, was virtually giving a bonus to their rivals in trade by relieving them from the difficulty of bargaining with the landowners for a right of passage through their property and by rendering unnecessary the investment of capital in waggonways. They were, however, unable to dispute two facts:—(1) That there was a growing demand for coals from the Tees, which were cheaper than coals of a corresponding quality from the Tyne and Wear, and (2) that the difficulties of navigation above Newport were such as to prevent all but the smaller class of vessels getting up to Stockton. According to William Cubitt, the eminent engineer who gave evidence on behalf of the bill, the proposed plan of improvement, while it would straighten the river, would not deepen it and render it navigable for such vessels as were best adapted to the coal trade. The advantages which the public, as well as the Company, would derive from the shipment of coals at Middlesbrough were too important to be set aside, and, on the 14th of May, after a final attempt on the part of Lord Wharncliffe to defeat the Bill,§ it was read a third time and passed, receiving the royal assent on the 23rd.

* Leonard Raisbeck to Thomas Meynell, 14th March, 1828.

† *Minutes of Evidence on Stockton and Darlington Railway Bill*, 1828, p. 128.

‡ *Ibid.*

§ *Durham County Advertiser*, 24th May, 1828.

The branch railway authorised by the Act of 1828 was to commence at the main line where it crossed Bowesfield Lane and run eastward by means of a bridge over the Tees past Newport to the river bank near Middlesbrough. For the protection of the navigation it was directed that one arch of the bridge, which was to cross the Tees from a certain close called Peel Nook, in the township of Stockton, to the Carr House Field, in the township of Thornaby, in the North Riding of Yorkshire, should be at least 72 feet wide, and 19 feet above the surface of low-water mark. The time allowed for the completion of the works was five years. The Company were empowered to raise an additional £100,000 by any of the means authorised by their former acts except promissory notes, or by borrowing it on bonds under their common seal.

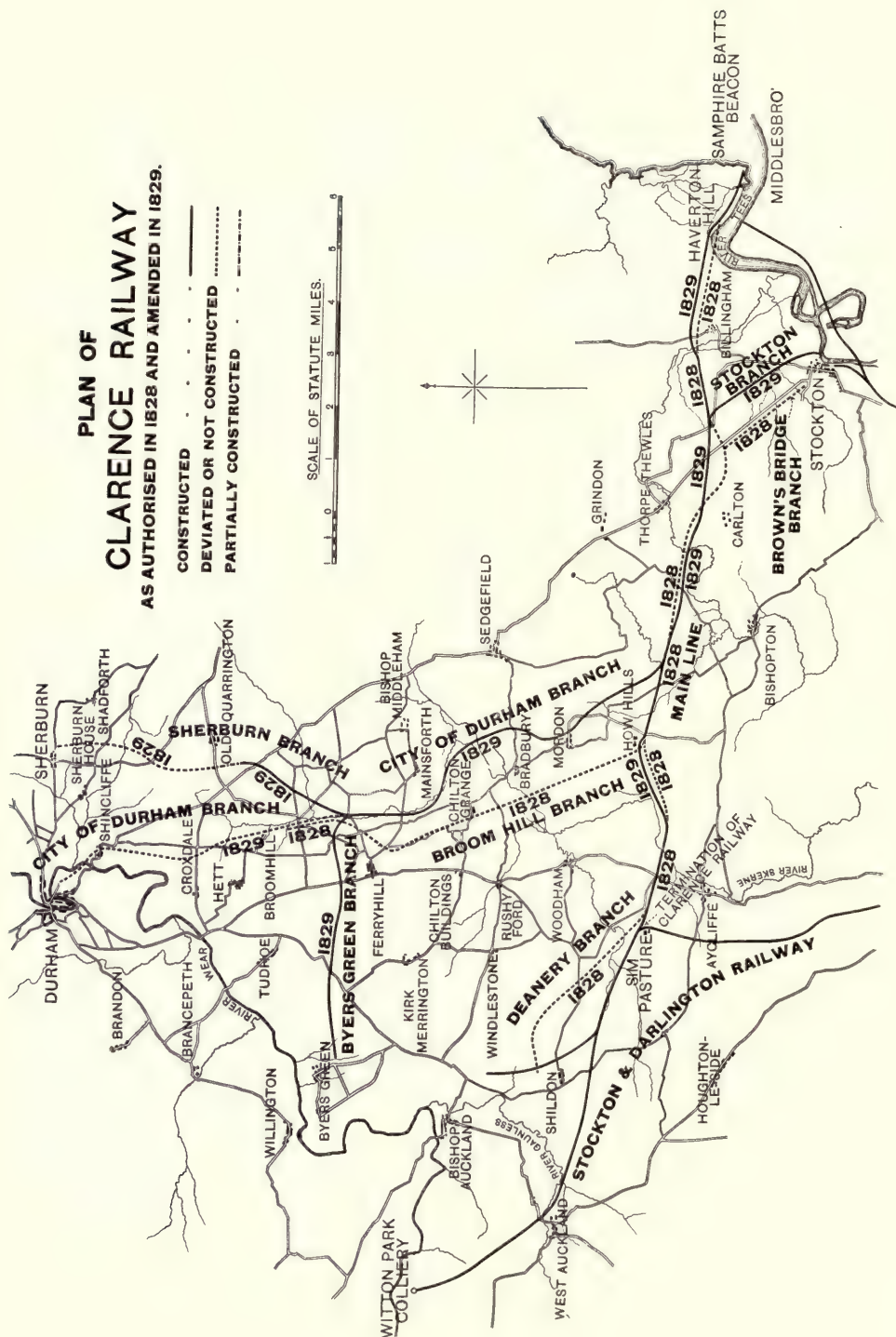
They were authorised to take certain tolls on the branch line differing in several cases from those on the main line. For coals carried for exportation, they might charge 1½d. per ton per mile or 1d. more than on the main line, but on the other hand they could not charge more than 2d. per ton per mile for limestone, road-metal and manure, and 4d. per ton per mile for lead, bar-iron and timber and other goods not scheduled. In addition to the ordinary tolls they were allowed to charge 2d. per ton for all coals, culm, cinders, stone, lime and manure passing over the bridge; and further to demand 4d. per ton for all "articles, matters and things" which should pass any inclined plane on the branch line, or be put into or taken out of any vessel at Middlesbrough by means of fixed engine apparatus or machinery. A clause was inserted in the Act compelling the Company to begin the construction of the uncompleted portion of the Hagger Leases branch within three months from the passing of the Act and to finish it within three years from the same term.

The scheme considered in January had been more extensive than that sanctioned in May, for it embraced, besides the branch line to Middlesbrough, a line from Middlesbrough to Cleveland Port, with a dock at the end, 390 feet by 168 feet, into which vessels from the river would have access by a lock 32 feet wide, and, in addition, a quay alongside the river 600 feet in length.* These were the days when, to quote from a speech delivered by Mr. Joseph Pease, in 1863, "the silence and solitude of this part of the Tees were only broken by the presence of a few grey-headed seals and a few shrimping women."

* Priestley's *Navigable Rivers, Canals and Railways throughout Great Britain*, 1831, p. 627.

PLAN OF CLARENCE RAILWAY AS AUTHORISED IN 1828 AND AMENDED IN 1829.

CONSTRUCTED ———
 DEVIATED OR NOT CONSTRUCTED - - -
 PARTIALLY CONSTRUCTED - · -



Mr. Meynell, having opposed the measure, felt that he could not take a prominent part in the execution of it, so resigned the office of chairman, which he had held since the 12th of May, 1821, and the control of the affairs of the Stockton and Darlington Railway Company was left more than ever to the far-seeing business men of Darlington.

A few days after the Lords passed the Stockton and Darlington Railway Bill they passed the Clarence Railway Bill, which, like the former measure, had met with great opposition from the coalowners of the Tyne and Wear—an opposition, however, abandoned in committee in consequence of certain arrangements.

The line sanctioned was to commence at the river Tees near Haverton Hill, about 4 miles north-east of Stockton, and proceed in a westerly direction, crossing the Sunderland road 3 miles north of Stockton, and passing by the village of Carlton and across the Skernie to Simpasture, where it was intended to join the Stockton and Darlington Railway at a point between the $17\frac{1}{4}$ and the $17\frac{1}{2}$ mile posts from Stockton, a rise of 306 feet above high-water mark in the Tees. Three branches were authorised: one from Simpasture Farm, near Finchale Cottage, by the north side of Middridge Grange, to the Deanery Estate near Bishop Auckland—not to be made without the consent of the Earl of Eldon; another from How Hills, by Great Chilton, to Broom Hill—a farm house 2 miles north of Ferryhill—to be made at the same time as the main railway; and a third from Harrowgate or Harget's House to Brown's Bridge near Stockton.

The total length of railway authorised was 26 miles 7 furlongs 3 chains, namely:—

	M.	F.	Ch.
Main Line—From Haverton Hill to Simpasture	14	0	4
Deanery branch 	3	4	6
Broom Hill branch 	7	2	6
Brown's Bridge branch 	1	7	7
	26	7	3

The line was intended to be a single one with passing places at intervals, one-sixth of a mile of these being allotted to every mile of railway. The gauge had to be the same as that of the Stockton and Darlington Railway. With one exception the tolls allowed by the Act were lower than those of the Stockton and Darlington Railway Company. This will appear from the following comparative statement:—

	Clarence Railway.	Stockton and Darlington Railway.	
	Main Line, etc. Per ton per mile.	Main Line, etc. Per ton per mile.	M'bro' Branch. Per ton per mile.
Coal, Culm, Coke, Cinders for exportation ...	$\frac{3}{4}$	$\frac{1}{2}$	$1\frac{1}{2}$
Do. for home consumption...	$1\frac{1}{2}$	4	4
Lime ...	$\frac{3}{4}$	4	4
Manure, Road-metal ...	$\frac{1}{2}$	4	2
Stone, Marl, Sand, Clay ...	$\frac{1}{2}$	4	4
Lead, Bar-iron, Timber, Deals and Staves, and all other Goods, Wares and Merchandise ...	3	6	4

The charge on the Clarence Railway for passing an inclined plane was 3d. per ton, on the Stockton and Darlington Railway, 6d. No person was to keep a carriage for the conveyance of passengers upon the railway without the licence and consent of the Company. The Company were empowered to raise £100,000 in shares and £60,000 by loan. Six years were allowed for the execution of the works.

On the 26th of May, the bells were ringing in Stockton and flags were flying from the masts of the ships in the harbour, to celebrate the passing of the Bill for the further improvement of the river Tees.* A month later (on the 21st of June) the town of Stockton was doing honour to the originator of the Clarence Railway†—Christopher Tennant (a native of Yarm, it is interesting to note), and his influential coadjutor, Henry Blanshard of London, who had succeeded, after so many vicissitudes, in obtaining an Act for the construction of the long projected railway.

The first general meeting of the Clarence Railway Company was held on the 8th of July, 1828, when the following directors were chosen to conduct the affairs of the Company:—

Henry Vansittart, Esq., Chairman; Sir William Foulis, Bart., Deputy-Chairman; Robert Appleby, Henry Blanshard, Richard Dickson, William Morrice, John Russell Rowntree, Thomas Richmond, John Stagg, John Holt Skinner, Thomas Allison Tennant, Rev. Henry Hildyard.

William Skinner, junr., was appointed treasurer, and Edward Steel, engineer. The clerk or secretary to the Company was John Smith.

Though after years of agitation the scheme for a northern railway had arrived at the desired haven, though the machinery for the carrying out of

* *Durham County Advertiser*, 31st May, 1828.

† Richmond, *Records of Stockton*, p. 153.

the Act was all prepared and a call of 5 per cent. on the shares authorised, no steps were taken towards beginning the work. The question had arisen whether, after all, the best line had been selected, whether the scope of the undertaking might not be enlarged with advantage. In August or September the Directors consulted George Leather, of Leeds,* the engineer of the Tees and Weardale line, who suggested several alterations. An amended line in accordance with these suggestions was then adopted. Mr. Storey having shown, when giving evidence on the Stockton and Darlington Railway Bill,† that Samphire Batts, a part of the river where loaded ships could lie afloat at low water, was a better termination than Haverton Hill, the line was carried $1\frac{1}{4}$ miles further to that point. Between Haverton Hill and Simpashire there were three deviations from Mr. Steel's line, the total length of which was between 3 and 4 miles.‡ These, besides reducing the amount of excavation and embankment, improved the gradients and straightened the line, enabling a horse to do additional work, in other words, to haul back one more empty waggon. The first deviation occurred between Haverton Hill and Billingham Beck, the second between Norton Toll Bar and Stillington Beck and the third between Stillington Moor House and Preston-le-Skerne. The line to Broomhill was superseded by a line branching off at Stillington Moor House and running up the bottom of a valley instead of going over a hill 186 feet high, in this way avoiding two inclined planes: one nearly 3 miles in length from a point near Ferryhill southward to the Skerne, not at all suitable for horse-traction; the other about a third of a mile in length from the same point northward, a very steep plane which it had been intended to work by means of a fixed engine.§

As the sanction of Parliament would have to be obtained to these alterations in their plan and to the substitution, in redemption of their pledge, of a branch to the Tees at Stockton in lieu of that proposed to Brown's Bridge, the Company decided to apply for leave to enlarge, as well as amend and alter, the powers of their Act. A branch line to Sherburn, through Coxhoe, Quarrington and Crowtrees having been proposed, the indefatigable Christopher Tennant, with his engineer, Edward Steel, set about making a survey of it, which they finished on the 17th of October, 1828.||

* *Minutes of Evidence on the Clarence Railway Bill*, 1829, p. 22.

† *Minutes of Evidence on the Stockton and Darlington Railway Bill*, 1828, pp. 193, 196.

‡ *Minutes of Evidence on the Clarence Railway Bill*, 1829, p. 55.

§ *Ibid.*, p. 45.

|| *Durham County Advertiser*, 18th October, 1828.

Then, as the result of a suggestion thrown out by the *Durham County Advertiser* of the 18th, a public meeting, over which the Mayor presided and at which Christopher Tennant attended, was held at Durham on the 28th, to arrange, if possible, for the extension of the Clarence Railway to the City.* A committee was formed for the purpose of promoting this object, with instructions to send a deputation from their number to wait upon the directors of the Clarence Railway. A survey of the country between Thrislington and Durham, having been made by Mr. Leather, the Company decided to comply with the request of the Durham deputation and carry the railway northward to the city, chiefly for the conveyance of general merchandise and passengers. It was proposed to cross the Wear at Shincliffe by a bridge, similar in design to that which Mr. Leather had built over the Aire at Leeds in 1827, the roadway being suspended from a cast-iron arch of 100 feet span.

The inhabitants of Wolsingham and Stanhope also made application to the Company to induce them to extend their line into Weardale,† and the Company appear to have had some intention of doing so, for they projected a branch railway, 11 miles in length, from the Bradbury and Sedgfield road, a little north of Mordon, past Howlish or Howlish Lane to the Wear, near Witton Park. There was to be a tunnel on this line a little north of the Black Boy branch of the Stockton and Darlington Railway, nearly a mile and three quarters long. From this proposed branch another line, 2 miles in length, was intended to strike off towards St. Helen's Auckland and form there a junction with the Hagger Leases branch of the Stockton and Darlington Railway.

On further consideration the idea of carrying the line past Howlish, or Howlish Lane, further westward than Bishop Auckland, was given up, and it was decided to take it to one strategic point only—St. Helen's Auckland. The whole line was then called the St. Helen's Auckland branch. The amended plan of the Clarence Railway also embraced two other branches running westward from the City of Durham branch, one to Great Chilton, the other to Byers Green. The new branch to Stockton left the main line at Norton Toll Gate and terminated at the Tees on the east side of the town.

On the 15th of November appeared the Parliamentary notices of a Bill to authorise these various alterations and extensions. When the shareholders met on the 16th of January, 1829, to consider the draft of this Bill, an amendment was moved that the branch to St. Helen's Auckland, should be abandoned, but it was lost. This part of the plan must, however, have been

* *Durham County Advertiser*, 1st November, 1828.

† *Ibid.*, 18th October, 1828.

dropped very soon afterwards, for the Company went to Parliament on an estimate, dated the 27th of February, which did not include the branch.*

When in a Committee of the House of Commons the Bill was strongly opposed by Robert Surtees, of Mainsforth, the historian of the County of Durham, who objected to the railway passing so near his house—within 1,100 yards of it—and crossing on embankments two of his private carriage roads. To propitiate him the Company offered to make a slight deviation in the course of the line in order to keep it on the west side of the Skerne; to give up the Chilton branch which passed over his property; and to insert a clause in their Bill restraining them from the use of locomotive engines in the townships of Chilton and Mainsforth.† In spite of these concessions Mr. Surtees renewed his opposition in the House of Lords, but withdrew it by arrangement on the 11th of May.

The Stockton and Darlington Railway Company, intolerant of competition, made a determined attack on the Bill both in the House of Commons and in the House of Lords. It was a conflict, they declared, “into which they were necessarily plunged.”‡

The sum of £1,705 10s., equivalent to a dividend of $1\frac{3}{4}$ per cent. on their share capital of £100,000, was expended in thus “protecting the Company’s interests against”—what they termed—“encroachment by the Clarence Railway.”§

From a scornful paragraph in the report of 1829 we learn what were the net results of this expenditure:—“Many objectionable clauses were struck out of the Act . . . others were so modified and amended as to remove the apprehensions of your Committee, and to induce them to believe that many years will probably elapse ere it will become needful (if ever) to recur to anything connected with that extraordinary scheme.”

Dreading the effects of the Darlington opposition the Clarence Railway Company appear at one time to have given up the idea of going to Simpasture.|| This vacillation on their part brought a petitioner against the Bill in the person of Richard William Christopher Peirse, of Thimbleby Lodge, the owner of Etherley and Railey Fell collieries. Owing to his representations, a clause was inserted in the Bill making it compulsory upon the Company to proceed with the line between Stillington Moor House and Simpasture at the same time as, or before, the Sherburn branch.

* *Minutes of Evidence on the Clarence Railway Bill*, 1829, pp. 15, 16.

† *Ibid.*, pp. 40, 41.

‡ Report to General Meeting, 14th July, 1829.

§ Statement of Accounts, 1828-1829.

|| *Minutes of Evidence on the Clarence Railway Bill*, 1829, p. 73.

The Marquis of Londonderry was no more friendly to the second Bill of the Clarence Railway than to the first. A few months before, on the 28th of November, 1828, he had laid at Seaham the foundation-stone of the north pier of a new harbour intended for the shipment of coals from his numerous collieries, and had made arrangements for the construction of a railway to the port from West Rainton, a village within four miles of Durham. He not only had an additional motive for objecting to the Clarence Railway, but a new weapon for attacking the amended plan. "Supposing this harbour at Seaham in operation," a witness was asked, "and a railway from Durham was carried there, are you not of opinion that that short line would be infinitely more advantageous for all the purposes of export and import than this projected line of the Clarence Railway to Haverton Hill, with the additional inconvenience of the navigation of the Tees?"* It could not be denied that the distance from Durham would certainly be shorter, though the country was very uneven. The Marquis reserved his attack on the Bill until it came up from the Committee. His argument was that the Company, for want of means, would never be able to complete their works, and the lands through which the railway was to pass would be left disfigured with heaps and mounds of rubbish, a nuisance and inconvenience to the land-owners.† He urged his objection to the bill again when it came up for the third reading on the 21st of May, but without success. The bill was passed and received the royal assent on the 1st of June.

The Clarence Railway, as authorised according to the revised plan, consisted of the following lines (see plan, p. 174):—

	M.	F.	Ch.
Main Line—From Samphire Batts to the Stockton and Darlington Railway at Simpasture ...	15	4	2
Stockton branch	2	3	2
Deanery branch	3	4	6
City of Durham branch	13	0	0
Sherburn branch	5	6	3
Byers Green branch	5	0	0
	<hr/>		
	45	2	3
	<hr/>		

* *Minutes of Evidence on the Clarence Railway Bill*, 1829, p. 130.

† *Northern Year Book*, 1829, p. 99.

The Company were empowered to raise an additional sum of £100,000. This sum they might borrow on bonds or by mortgage. In addition to the tolls allowed by the former Act they were authorised to take for every coach or other carriage used for the conveyance of passengers or small packages 6d. per mile. They were restrained from the use of locomotive engines on part of the Byers Green branch as well as on part of the City of Durham branch.

On the 12th of June the directors were authorised to begin the construction of the railway. The outlook for the undertaking at this time was not a very bright one. The "Regulation of the Vend," an arrangement among the coal-owners of the Tyne and Wear for securing a fixed price for their coals and doing away with the competition of colliery with colliery, had not been renewed the previous Christmas. As a consequence of the open trade, prices had fallen so low that the coal-owners of the Tees were unable to compete with their northern rivals in trade. The result was that, while in 1828, 20,943 tons of the best coals and 25,241 tons of small coals were sent from the Tees to the London market, in 1829 the quantities shipped to that destination were only 4,373 tons of the former and 3,808 tons of the latter. "To ensure the continuance of the coal trade to the river Tees" at such a crisis the Stockton and Darlington Railway Company found it necessary to reduce their dues 6d. per ton on coals for exportation.* The Regulation came into force again on the 1st of September, but the temporary suspension of it must have somewhat alarmed the shareholders of the Clarence Railway.

As for the Stockton and Darlington Railway Company, they did not at this time consider the coal export trade of more value to them than £5,000 a year, for, on the 25th of September, they let to Jonathan Backhouse, Henry Stobart and Joseph Pease, the tolls arising from coals carried for shipment at this amount.

Within three months of the passing of the Act the Clarence Railway Company were in troubled waters. An injunction was taken out against them in August by George Coates, of Norton, to restrain them from proceeding with their works unless a bridge of the width of 12 feet, instead of 8 feet, as proposed, were thrown over his mill-race,† a point determined in his favour by the Lord Chancellor on the 18th January, 1830.‡ Then Messrs. John and Jefferson Hogg compelled them to have recourse to a jury, to assess

* Sub-committee minutes, 20th April, 1829.

† *Northern Year Book*, 1829, pp. 139, 190.

‡ *Durham Chronicle*, 30th January, 1830.

the value of $10\frac{1}{2}$ acres of land required at Norton. The sum demanded was £3,605, the jury's award £2,100.* It was found difficult to raise money. Mr. Blanshard, taking advantage of the agitation against the high prices of coals, endeavoured to obtain the pecuniary assistance of the Corporation of London by laying before them his plan for supplying the metropolis with coals by means of the Clarence Railway, but, though the Committee of that Corporation approved of the plan and thought it deserved a large encouragement, they could not recommend the application to this purpose of any of the public money entrusted to them.†

Meanwhile the Stockton and Darlington Railway Company, complaining of the "aggression" of the Clarence Railway Company and the "spirit of wanton and unprovoked hostility"‡ of the Tees Navigation Company, were proceeding steadily with their various works. On the 27th of October, 1829, the Croft branch was opened amid great rejoicings at Darlington. Some delay had taken place in the execution of the Middlesbrough branch owing to the obstacles thrown in the way of the Company by the agents of the Bishop of Durham. For 6 acres 1 rood 26 perches of land required near Stockton they demanded £5,073 9s. 3d., not calculating how much his lordship would be benefited by the new branch, for it was proved, at an inquisition held at Durham on the 7th of March, 1829, that, out of the 111,000 tons of coals which had been exported from the Tees by means of the Darlington Railway, 100,000 tons had come from the Bishop's collieries.§ The amount of the jury's award was £2,000.||

As early as October, 1828, Joseph Pease had made a contract with Captain Samuel Brown to erect a suspension bridge¶ across the Tees for £2,200. The foundation stone of the bridge was laid on the 18th of July, 1829, and on the 14th of August, the directors accepted Messrs. Carter and

* *Durham County Advertiser*, 12th December, 1829.

† *Northern Year Book*, 1829, p. 192.

‡ Committee Minutes, 20th November, 1829.

§ *Durham Chronicle*, 14th March, 1829.

|| *Durham County Advertiser*, 14th March, 1829.

¶ The difficulty of erecting arches without obstructing temporarily the channel of the river and arousing the antagonism of the Tees Navigation Company no doubt led the directors to adopt the suspension type of bridge. They were, however, in possession of a plan to obviate this difficulty, which anticipated by twenty-one years a famous device of Robert Stephenson's, affording a notable example, among others, of the fertility of ideas at this time on the Stockton and Darlington Railway. James Dixon, one of the engineering staff of the Company, in submitting a design for a cast iron bridge, proposed to erect each rib separately upon a scaffolding or centre placed in a pontoon at such an elevation that when floated to the site of the bridge the ends of the rib would clear the skew-backs on the pier and abutment; the pontoon being then moored in this position, and lowered by admitting water into the hold, the rib would consequently rest on the skew-backs. (See letter written by Robert B. Dockray, Jeaffreson's *Life of Robert Stephenson*, vol. ii., pp. 290, 291.)

Simpson's tender of £1,140 for a stone bridge across the old channel of the river.

Having offered one premium of 150 guineas for the best plan of a coal shipping staith and another of 75 guineas for the second best plan, they had made their selection in April, adjudging the first premium to Timothy Hackworth and the second to J. Cooke of Yetholm. On the 1st of September they authorised the erection of the first set of gears at *Port Darlington*—a name which gave no little umbrage to the people of Stockton.

About the same date the directors purchased from the lessees of the Bedlington Glebe colliery (Messrs. Stephenson, Mason & Company) a steam-engine of 15 horsepower for raising the waggons to the upper floor of the staiths. Everything was progressing favourably when, on the 19th of



T. H. Hair, del.

MIDDLESBROUGH DROPS.

J. Brown, sc.

October, the serenity of the Stockton and Darlington board-room was ruffled by a legal notice from the Tees Navigation Company, ordering the directors to take away the piles which had been driven into the old bed of the river and to desist from building the bridge.

The Railway Company, when soliciting the Act of 1828, had not considered it necessary to obtain power to erect a bridge over the old channel, and the Navigation Company, taking advantage of this omission, were, consequently, enabled to stop the works. No other course at this time seemed open to the Railway Company but to go once more to Parliament, and they accordingly gave notice, on the 21st of November, of their intention to apply for "further and more effectual powers."*

* *Durham County Advertiser*, 21st November, 1829.

The new Bill was intended to embrace other objects, these being (1) the making of two short lines from the Middlesbrough branch, one about three-quarters of a mile in length, striking northward from the Thornaby road near Stockton bridge and running parallel with the river through Mr. Meynell's land, to a point in the Rev. Ralph Ord's, opposite to Cleveland Row; the other a quarter of a mile in length from a point near the end of the branch to a close adjoining the river belonging to Thomas Richardson; and (2) the construction of goods wharves, staiths and landing-places at the terminations of these branches.

Another mode of settling the difficulty suggested itself to the directors at the beginning of the new year and, on the 8th of January, 1830, they approached the Tees Navigation Company in a spirit of conciliation, informing them that the arches in the proposed bridge had been ordered to be extended in width—the two side arches to 18 feet span in lieu of 13 feet and the centre arch from 23 feet span to 30 feet—and making the following proposition:—That the railway should proceed to complete their works on the understanding that, at any future period within seven years, the Navigation Company should be at liberty to question their right to erect a bridge across the old channel of the river after giving them at least twelve calendar months' notice of their intention to do so, and that, in this case, the Railway Company should be at liberty to insist upon the sufficiency of the powers granted by their existing Acts or to apply to Parliament for an extension of them.”*

But what the Navigation Company required was not an increase of width in the bridge but an increase of height. The plans deposited by the Railway Company for the Middlesbrough branch did not, however, admit of this alteration being made.†

The idea of a draw-bridge was then suggested, and a plan of such a bridge having been prepared by Thomas Storey, it was submitted in March to the Navigation Company and met with their approval. After the Railway Company had given them an assurance that every requisite facility would be provided for the opening and shutting of the draw-bridge, they agreed to the terms of the proposition made to them in January.‡ The Railway Company, on their part, relinquished the Bill then in progress through Parliament: a draw-bridge—supplied by the Low Moor Iron

* Sub-committee minutes, 8th January, 1830.

† *Ibid.*, 22nd January, 1830.

‡ *Ibid.*, 26th March, 1830.

Company, whose tender of £810 was accepted on the 14th of May, 1830—eventually took the place of the stone bridge, and an incident productive of much ill-feeling came to an end.

The works on the Hagger Leases branch, so long suspended, had been recommenced in July, 1828, and in September, 1829, the first bridge across the Gaunless at West Auckland was finished and the second in progress. The branch was opened as far as Cockfield Fell on the 1st of May, 1830, when a procession consisting of four railway coaches from Darlington and several waggons from Brusselton—all drawn by horses—went up the line with



SKIEW-BRIDGE OVER THE GAUNLESS.

flags and banners flying, bringing back, as a trophy from the collieries, a number of loaded waggons.* Six months later the branch was completed to the parliamentary termination at Hagger Leases Lane, a little over $4\frac{3}{4}$ miles from St. Helen's Auckland. It was carried over the Gaunless near West Mill, by a skew-bridge—a swin-bridge it is called in the minutes†—

* *Durham County Advertiser*, 8th May, 1830.

† Sub-committee minutes, 12th February, 1830. "Swin" is a dialect word meaning "to traverse diagonally." The name must have lingered in the district until 1857, when it puzzled the Ordnance Surveyors, unfamiliar with the north-country dialect. They had heard of a "swing-bridge," but not of a "swin-bridge," and without making further inquiry they put down this name on their plan, absurdly inappropriate as it was when applied to a structure of stone over a stream so unnavigable as the Gaunless.

the square or right section of the arch being 19 feet, the length of the face of the arch 42 feet, and the acute angle formed by the line of railway with the face of the abutments 27° . The length of the abutments was 34 feet and the breadth of roadway inside the parapet walls 12 feet.*

Designed by Thomas Storey,† the bridge was built by James Wilson of Pontefract, as recorded on a moulded panel on the north side. The contract for the work had been let at first, on the 12th of February, 1830, to Thomas Worth and John Batie at £327,‡ but after piling the foundations and laying the lower courses of masonry they gave up the work, and, on the 28th of May, the contract was re-let to Wilson at £420.§ The principle of the oblique arch being but imperfectly understood at this time, the construction of the bridge was a work of some difficulty. Its downfall was solemnly predicted, but when the centering was withdrawn, a few days before the opening of the branch, the crown of the arch did not drop half an inch.

As an early example of the use of the oblique arch for the purpose of a railway—not the first, however, for George Stephenson had already built the Rainhill skew-bridge on the Liverpool and Manchester Railway—this little stone bridge over the Gaunless, hidden away in a narrow gorge at the foot of a lonely fell in the south-west corner of Durham, has a distinct place among the engineering monuments of the early railways.

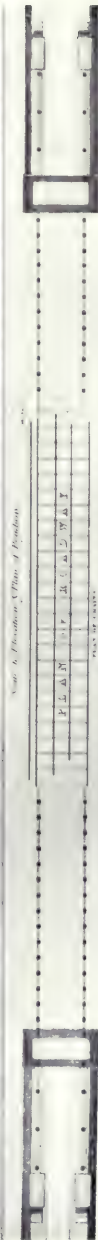
There was an interesting gathering at the offices of the Butterknowle and Copley Collieries on the 2nd of October, 1830, when the whole branch was thrown open for public use. The occasion furnished an opportunity to Mr. Joseph Pease to correct some erroneous statements which had been put into circulation after the death of Mr. Huskisson at Parkside, concerning the loss of life on the Stockton and Darlington Railway. The number of persons killed on the line, he stated, since the opening had been fifteen: of these, seven were children and others secretly riding on the waggons or trespassing on the railway in defiance of the Company's orders and regulations, while almost all the other instances were those of wilful daring or gross neglect on the part of the sufferers. About 700,000 tons of goods and minerals had been carried along the railway, the coaches had travelled upwards of 200,000 miles without one accident worthy of notice to either passengers or vehicles.

* *Proc. Inst. Civil Engineers*, vol. iv., p. 60.

† *Durham Chronicle*, 9th October, 1830. The plan of the bridge was prepared by William Burn, clerk of the works at the Suspension Bridge over the Tees. Writing to Richard Otley on the 21st January, 1830, he informed him that he had in hand a design for a bridge on skew principles, which would be forthcoming in the course of the following week.

‡ Sub-committee minutes.

§ *Ibid.*



HEIGHT OF BRIDGE ABOVE TEES, AT SUSPENSION 201
 SPAN OF BRIDGE 201
 WIDTH OF PLATFORM ON BRIDGE 20
 HEIGHT FROM SLACK OF CABLE TO STRUT TIE 20
 HEIGHT OF BRIDGE ABOVE TEES, AT SUSPENSION 201



Jas. Dixon, del.

CALCULATED TO SUPPORT A TON 15
 WEIGHT OF LOADS PER FOOT OF THE BRIDGE 15
 SECTIONAL AREA OF THE CHAIN 30
 POSITION OF THE LOAD ON THE DECK 15
 WEIGHT OF THE BRIDGE 15



W. Miller, sc.

Railway Suspension Bridge, over the Tees, near Stockton.

That it was much safer to travel on the railway than on the road he showed from the register of the General Post Office, which gave the average of mail-coach accidents as one in every 20,000 miles.*

The opening of the Middlesbrough branch followed close upon that of the Hagger Leases branch. Early in December experiments were made to test the stability of the suspension bridge. The first of these took place on the 9th, when a weight of 18 tons 1 cwt. was placed on the centre of the bridge. The result was a deflection of $9\frac{3}{10}$ inches. On the 13th, twenty-eight waggons, weighing 37 tons, were drawn along the bridge by an engine and tender weighing 8 tons: the depression, where greatest, was $5\frac{8}{10}$ inches.

In the course of an experiment with 16 waggons, weighing 66 tons 12 cwt., the masonry of both towers was considerably affected, and two of the cast-iron retaining plates split on the Yorkshire side of the river. It was not, therefore, deemed prudent to exceed this weight. From other experiments, it was found that an engine with any number of empty waggons, when closely coupled, might safely pass over the bridge. On the 20th further experiments were made by Alexander Mitchell and Thomas Storey, to ascertain what was the best mode of distributing the weight which might prudently be taken across the bridge. Satisfactory results were obtained by connecting four waggons together by means of chains with couplings which kept them 9 yards apart.†

The failure of the bridge was a great disappointment to the Company, who had been led to believe it would support a weight of 150 tons.

The ceremony of opening the Middlesbrough branch took place on the 27th of December, 1830.

Early in the morning of that day a train was made up at the Darlington depôts, consisting of a number of railway coaches and waggons fitted up with seats. These were soon filled with eager passengers, most of whom wore, suspended round their necks, by blue ribbons, medals struck for the occasion, having, on the obverse, a perspective view of the coal staiths at Middlesbrough, and on the reverse, a representation of the suspension bridge near Stockton.‡

To this train was attached a new locomotive engine on four coupled wooden wheels, having inside cylinders beneath the fire-grate end of the

* *Durham Chronicle*, 9th October, 1830.

† Stockton and Darlington Minute Book.

‡ *Durham Chronicle*, 1st January, 1831. See p. 190 for illustration reproduced from Sir Hugh Gilzean Reid's "Middlesbrough and its Jubilee," by permission of the proprietors of *The North Eastern Daily Gazette*.

boiler, and, what was a unique feature at this time, a steam dome in the form of a copper globe. This was the "Globe," which had been specially designed by Timothy Hackworth for the purpose of conveying passengers and merchandise. The train left Darlington a little after 10 o'clock: it was the second great passenger train to be hauled from the town by a locomotive engine. The first point of interest was the suspension bridge. Some time was spent in the inspection of this picturesque structure, which was about 412 feet in length, 16 feet in breadth and 20 feet in height from the surface of the water, spring tide. The span of the bridge between the points of suspension was 281 feet 4 inches and its weight 111 tons. The roadway, by means of 110 perpendicular rods swung upon twelve chains, six on one side and six on the other.



From Timothy Hackworth's business card.

THE "GLOBE" ENGINE.

After having received a contingent of passengers from Stockton, the train proceeded along the branch line through what the reporter of the period called the "romantic vale of Cleveland," to Middlesbrough, accompanied by a number of loaded waggons, one of which contained a huge block of solid coal, weighing no less than $3\frac{1}{2}$ tons. The rails over which the train passed were of malleable iron, but heavier than those laid on the main line, weighing 33 lbs. per yard instead of 28 pounds. They were "scarf-jointed," fastened to the chairs by means of iron wedges on what was called the "keyed plan," the chairs resting on oak blocks, from 28 to 30 inches long, 5 to 7 inches broad, and 6 to 8 inches deep, supplied from Portsea at 10d. each. At Middlesbrough the chief, and indeed the only, objects of interest at this time were the staiths, which were so constructed that six vessels could be loaded at the same time. The shipment of the first cargo of coals on board the "Sunniside" was a noteworthy incident in the day's proceedings. The process by which this was accomplished was new

to Teesside. The loaded waggon was first hoisted 18 feet high* by means of a steam-engine to the upper floor of the staiths, which, being covered in, formed a kind of gallery 450 yards long. It was then drawn by horse power along the rails laid in the middle of the gallery to what was known as a "drop." There it was placed upon a cradle suspended from the head of the sheer-legs of the drop, and lowered in a curved line to the deck of the vessel, when the man who had accompanied it in its descent unbolted the bottom board and enabled the waggon to discharge itself into the hold. The action of a counter-balance weight, which had been raised by the descending load,



J. Dixon, del.

STOCKTON AND DARLINGTON RAILWAY OFFICE.

brought back the empty waggon to the level of the upper rails. It was then pushed to an opening on the opposite side of the gallery and let down by steam power at right angles to the building, a twist being given to it by two diagonal iron rods passing through holes in the corners of the frame and slightly curved. This twist caused it to swing round and alight on the rails with a jerk, a sufficient impetus being given to carry it to a siding nearly 100 yards away.†

A large table had been set out in the gallery of the staiths, which was lighted with portable gas, and, after the shipment of the coals, a company of

* *Second Report on Railways*, 1839, Qn. 4,471.

† Sir George Head, *Home Tour*, vol. i., p. 301.

600 persons sat down to refreshments; Mr. Francis Mewburn, the solicitor, occupying the chair and Mr. Richard Otley, the secretary, the vice-chair. The huge block of coal, so conspicuous in the procession, was shipped for London the following day in the brig "Maria."

Near to Port Darlington, on the Middlesbrough estate, a new town had been planned, which the local press, at least, believed would soon become "a place of great trade and opulence."* The estate had been purchased by Thomas Richardson from William Chilton, of Billingham, prior to May, 1829. A Company had then been formed to develop it, under the style and title of the Middlesbrough Owners, the members of which were Thomas Richardson, Henry Birkbeck, Simon Martin, Joseph Pease, Edward Pease, junr., and Francis Gibson. In the square area of 32 acres laid out as the site of the new town—the first town to owe its existence entirely to the railway—the first house had been built in April, 1830, by George Chapman.† This was the nucleus of modern Middlesbrough with its population of over 100,000.‡

When the year 1830 came to a close, the works of the Stockton and Darlington Railway were all completed, including new offices at the corner of Northgate and Union Street, Darlington—a building of brick with stone quoins and sills, designed by William Alderson. The works of the Clarence Railway were in progress, but not far advanced, the first cutting having been commenced on the 2nd of March and three other cuttings let on the 14th of May in this year.



* *Durham Chronicle*, 1st January, 1831.

† *Northern Tribune*, 1854, p. 178.

‡ Population in 1911, 104,787.

CHAPTER VI.

THE LINKING OF THE TWO SEAS BY RAILWAY.

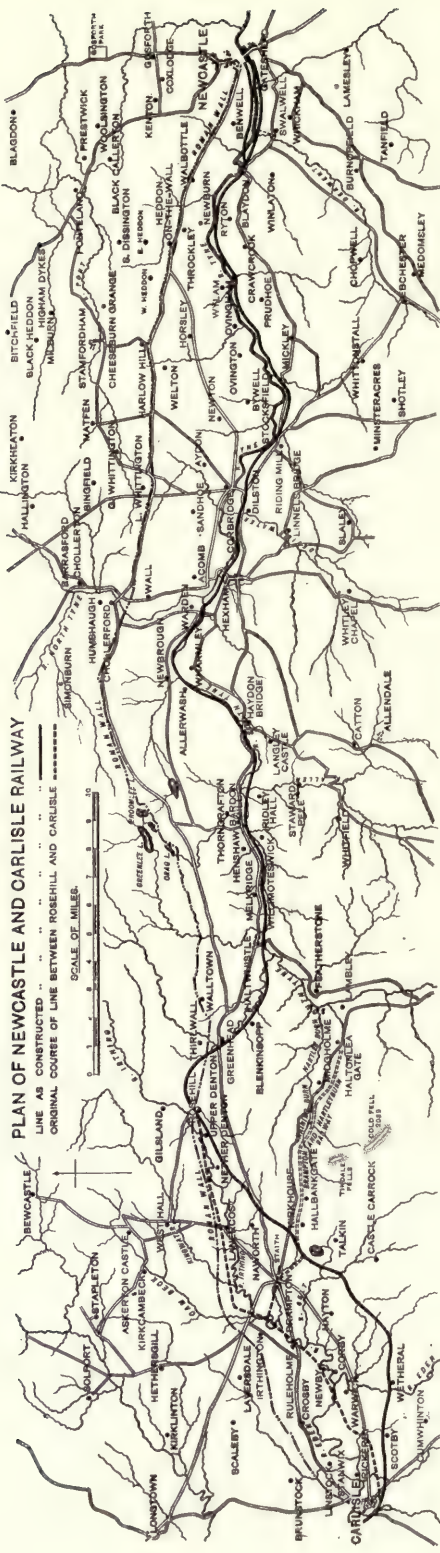
At the time of the opening of the Stockton and Darlington Railway there were two great projects in the north of England which were attracting much public attention. One was for a railway between Newcastle and Carlisle, the other for a railway between Leeds and Hull. Links, respectively, in a double chain of communication between the two seas, these lines possessed a national importance to which the older, and historically more interesting, railway could scarcely lay claim.

The Newcastle and Carlisle scheme had reached a more advanced stage than the other. For the purpose of introducing a bill into Parliament in the session of 1826, another survey of the country between Newcastle and Carlisle had been made—commenced under the direction of William Chapman and Josias Jessop and completed under that of Benjamin Thompson—and a line of railway adopted which, from the landowners' point of view, was peculiarly free from objection, interfering little with gentlemen's houses and grounds and requiring, throughout its whole course, the removal of but one cottage.

This line was intended to be worked entirely by horses, the use of locomotive engines and inclined plane machinery being considered incompatible with the design of a public railway which was to be used by carriers of all kinds under stated conditions like a common highway. While it seemed doubtful, both to Benjamin Thompson and William Chapman, whether locomotive engines, as then constructed, were more economical than horses, it was certain that they would arouse a great deal of prejudice against the railway among the country gentlemen, and make it necessary to lay down much heavier rails.

From this intended railway, some Dumfriesshire gentlemen proposed to carry a branch from Brampton to Port Annan; but, though they offered to give the land through which the railway would have to pass "without any compensation whatever,"* the scheme dropped for want of support.

* *Tyne Mercury*, 25th October, 1825.



On the 12th of November, 1825, appeared the parliamentary notice of a line starting from the Newcastle Quay at the High Crane near the Tyne Bridge and following the course of the river westward—at first on “gears” to Low Elswick, and then along the river bank to Scotswood where a railway bridge was to be erected, afterwards on the south side—from Shibdon Haughs past Blaydon, Ryton, Prudhoe and the Riding, and through Farnley Scar, to Hexham. Crossing the main stream again at the west end of Tyne Green and the North Tyne at Howford, it kept on the north side of the South Tyne past Haydon Bridge to Haltwhistle. It then ran up the valley of the Tipalt, past Blenkinsopp Castle and Greenhead, reaching the summit level at Bittlestones near Baron House. Instead of following Chapman’s level course through the south-east corner of Naworth demesne to Milton, and making a descent of 370 feet afterwards by a succession of inclined planes, it crossed the Irthing near Upper Denton, and went down the gorge on the north side, leaving Lanercost Abbey on the left, to the King Water. From this point it took a south-westerly direction past Brampton Old Church, and crossed the Irthing to Ruleholme, pursuing its way under Newby, across the Eden, within a short distance of Aglionby and Botcherby, to the Canal Basin at Carlisle, which it reached by an easy ascent from the Caldew. The rising gradients were from 1 in 1,173 to 1 in 264 and the falling gradients from 1 in 1,320 to 129.

The plan included seven branches, viz. :—(1) From Elswick Dene, near the Herd’s House, to Thornton Street, Newcastle-upon-Tyne; (2) from Scotswood to Lemington Glass Works and the Holywell and Wylam waggonways; (3) from the south end of Scotswood Bridge to Derwent Bridge, near Swalwell; (4) from the Low Mill haugh, Hexham, to the road leading to Hexham Bridge from the east end of the town; (5) from Bright Riggs near Bracken Hill north-west of Brampton, passing by means of a tunnel, 462 yards long, through the ridge to Warren House and Lord Carlisle’s waggonway, near the staith; (6) and (7) from different points in the township of Botchergate into Carlisle.

The Greenwich Hospital Commissioners, in order to show the practicability of an alternative line from the North Tyne eastward, employed George Stephenson to make a survey of the country on the north side of the Tyne. Stephenson’s line, which was levelled by Joseph Locke, commenced at Warden Bridge, passed by means of a tunnel, 440 yards long, under the hill behind the Hermitage, and proceeded by the north end of Hexham Bridge between Beaufront House and the river to Corbridge, where it was

taken to a higher level at Thornbrough by means of an inclined plane, $1\frac{3}{4}$ miles in length, rising at the rate of 1 in 36. It then ran under Harlow Hill, past Heddon-on-the Wall, and within a quarter of a mile of the gates of Woolsington Hall, to the south-west corner of the Town Moor at Newcastle, from which point it was carried by another inclined plane, $1\frac{1}{4}$ miles in length, with a fall of 1 in 48, to a quay near the Ouseburn at the east end of the town; a total distance of $23\frac{1}{2}$ miles, the line being three quarters of a mile shorter than Benjamin Thompson's.*

George Stephenson, in examining the Newcastle and Carlisle line, found some serious errors in the levels,† and as these were likely to jeopardise the interests of the bill, the directors decided, on the 12th of February, 1826, to give up the idea of applying to Parliament that session. "Between February and July," to quote from a report to the subscribers, dated 9th February, 1827, "the county of Northumberland was absorbed in the business of contested elections to a degree which rendered attention to other matters quite out of the question."‡ It was thus impossible to complete and deposit the plans in time for the session of 1827. Meanwhile, the agents of Lord Carlisle had suggested an alteration in the course of the railway, pointing out that, by taking it in a more southerly direction, it would pass by the coal staiths near Brampton, and the expense of a branch, estimated to cost £10,000, would be saved.§ Mr. Chapman, on a cursory view, did not think this route could be followed on account of the inclined planes which would be required. John Studholme, of Carlisle, however, proposed and surveyed a line from Carlisle to the summit level, running by the south side of Durranhill, the north end of Scotby, a little to the north of Wetheral and Corby, through the village of Hayton, past the south point of Naworth park, through the village of Upper Denton, and south of Mumps Hall to Baron House Bog.|| Those short-sighted inhabitants of Brampton who had persuaded themselves that the railway would ruin the town, were now able to take a more cheerful view of their prospects; for the new line, being acceptable to the Earl of Carlisle and other Cumberland proprietors, was adopted at a meeting held in Newcastle on the 7th of June, 1827. In vain did some of the more public-spirited inhabitants send a deputation to the

* *Evidence on the Newcastle and Carlisle Railway Bill*, 1829, pp. 174-192.

† Michael Longridge to Robert Stephenson, 1st November, 1825. *Life of Robert Stephenson*, vol. i., p. 112.

‡ *Newcastle Courant*, 3rd March, 1827.

§ *Carlisle Journal*, 3rd March, 1827.

|| *Tyne Mercury*, 12th June, 1827.

directors, representing, what they conceived to be, the real feelings of the town; it was then too late to revert to the original plan.*

It was not until the 8th of April, 1828, that the course of the Parliamentary line was definitely fixed, after another alteration had been made to it, diverting it still further southward towards Talkin Tarn and Hellbeck for the purpose of avoiding, in the first place, an inclined plane at Capon Tree (between the Lower Gelt Bridge and Brampton) and, in the second, the property of Sir Hew Dalrymple Ross, who objected to the railway being carried past his house at Hayton, requiring as the price of his consent to this invasion of his privacy the sum of £8,000.† The parliamentary survey was begun on the 9th of April by Thomas Oswald Blackett at the Newcastle end and, shortly afterwards, by John Studholme at the Carlisle end. The plans were finished in August, and on the 4th of November, appeared the second notice of an application to Parliament: this time for a line from the west end of the Close, Newcastle, to the summit level as before, and then by Milton across the Hellbeck and Gelt, by Wetheral and Scotby, to the Canal Basin at Carlisle, with but one branch—from Elswick Dene to Thornton Street.‡ The greatest inclination of any plane on this line was 1 in 107, the least 1 in 2,263.§

Among the proprietors of estates affected by the bill there were 35 who objected to the railway passing through their respective lands and grounds. Of these, the most irreconcilable were Charles Bacon, of Styford, and his son, Charles Bacon Grey. Six years before, Mr. Bacon had purchased a farm on the opposite side of the river and, through part of this farm, at a distance of a quarter of a mile from his house, the railway would have to pass. The Railway Committee used every means in their power to satisfy him. They asked if they could go through his estate in a way that would be more agreeable to him. No! any other line would be equally abnoxious. They offered to raise a mound of earth, 6 feet high, and plant it with trees and shrubs so that the waggons on the railway would not even be seen from the house and grounds. But Mr. Bacon would hear of no compromise, and finally closed the negotiation by stating “that no proposal the directors of the Railway could possibly make to him, would ever obtain his consent to

* *Carlisle Journal*, 24th April, 1880.

† *Ibid.*, 12th April, 1828; *Tyne Mercury*, 15th April, 1828.

‡ *Tyne Mercury*, 4th November, 1828.

§ *Evidence on Newcastle and Carlisle Railway Bill*, 1829, p. 22.

the line passing along *any part* of his property.”* A striking contrast this with the attitude of Mr. Cuthbert Heron—generally known as Sir Cuthbert Heron—who, at an early meeting on the 26th of March, 1825, had declared that, if the railway should pass, not only through his estate but through his own house, still he would approve of it.† But however objectionable the railway might be to Mr. Bacon, the growth of the intercourse between the two towns had made it a necessity. Formerly there was only one vehicle of conveyance between Newcastle and Carlisle, and that was a sort of “whiskey,” which was employed once a week for carrying the Newcastle papers, and now and then a solitary passenger: there were only two carriers with “three or four miserable carts.”‡ In 1829, there were two stage coaches running daily—the “True Briton” and the “Royal Mail”—and the road was covered with carts both by night and by day. These carts travelled along an extremely hilly road, taking three days as a rule to pass from one town to the other. The stage coaches covered the distance in 8½ hours.

To Mr. Bacon, the railway was merely a blot on the landscape, an eyesore and a nuisance. To the general public, however, it was a smooth highway for the passage, in one direction, of the Baltic produce and the merchandise of Northern Europe and, in another, of the commodities of the West Indies, America, Ireland, the south-west of Scotland and the interior of Cumberland. Moreover, with the example before them of the Stockton and Darlington Railway where, in the words of Mr. James Losh, the eloquent Recorder of Newcastle, “conveyance was so rapid, and so cheap, that many went for amusement who would otherwise have remained at home, and others who travelled on business were enabled to do so more cheaply and with greater facility,”§ they hailed the railway as the long-looked-for medium of communication.

The time had gone by when Mr. Charles Bacon and Mr. John Hodgson, the chief opponents of the scheme, could have enlisted popular prejudice on their side. Among the landowners they were in a hopeless minority. The Duke of Northumberland and his brother, Lord Prudhoe, had given their assent to the bill; Lord Carlisle was a party to the contract; the Mayor and Corporation of Newcastle and Mr. Henry Howard of Corby were shareholders; Mr. Thomas Wentworth Beaumont, of Bywell, and the Governors of Greenwich Hospital were friendly to the measure.

* Case of the Promoters of the Bill, 1st February, 1829. † *Tyne Mercury*, 29th March, 1825.

‡ Speech by James Losh, 18th February, 1829, *Northern Year Book*, 1829, p. 35.

§ *Ibid.*, p. 34.

Mr. Bacon, as portrayed by the Company, was a stubborn and prejudiced landowner who, sooner than consent to any intrusion on his privacy, would deprive the public of a great benefit,* but this was not exactly his attitude before the Committee of the House of Commons. The ground on which he attacked the bill was that the best line had not been selected.

A mass of evidence was brought forward to prove that the foundations of the proposed line and the bottom of the slopes in deep cuttings would be damaged by floods like those of 1771, 1815 and 1828, which rose to a height respectively of 22 feet 5 inches, 17 feet 9 inches and 15 feet 2 inches. One witness had seen coals washed out of the waggons on the Wylam Colliery Railway,† another had seen keels driven over Shibdon Haughs in floods.‡ Joshua Richardson, who had ascertained the comparative height of the floods with reference to the levels of the railway, showed that in 1815 nearly 20 miles would have been under water and, in 1826 and 1828, about 10 miles.§ Then Robert Stephenson was called and, being asked whether he considered it advisable to mark out a line of railroad in which, in certain years, there might be 20 miles covered with floods and in other years, 10 miles, replied: "I would never attempt to lay a line of railroad of that description"|| and a similar opinion was expressed by Joseph Locke.¶ George Leather, also, in a report on the line, dated April, 1828, had no doubt that in the flood of the previous December, over the whole distance from Ryton Willows to Eltringham Boat-house, the sectional line of the proposed railway was under water and that, in several parts, particularly above Hagg Bank, it was covered several feet deep. The proposed deep cutting and tunnel through Hagg Bank, at the level laid down on the section, appeared to him so extraordinary a proceeding that he would scarcely have thought it possible that any person could have suggested it.**

Having obtained from Greenwich Hospital the plan of George Stephenson's line of railway, they made a copy of it, and endeavoured to prove its superiority to Benjamin Thompson's, pointing out that, by adopting it, many expensive works would be saved—the Scotswood Bridge, the paving of the track at certain places to prevent the floods washing away the foundations, the walling at Shibdon Haughs, the piling for the quay at Herd's House, etc., the total amount saved being estimated at £47,640.††

* Case for the Promoters of the Bill, 17th February, 1829.

† *Evidence on the Newcastle and Carlisle Railway Bill*, p. 103.

§ *Ibid.*, p. 107.

|| *Ibid.*, p. 126.

¶ *Ibid.*, p. 155.

‡ *Ibid.*, p. 147.

** *Ibid.*, p. 227.

†† *Ibid.*, 1829, p. 175.

The points advanced in favour of the line were that it was cheaper—not liable to be flooded except for about half a mile near to Corbridge—passed through a better coal-field (at Callerton) and reached a lime district sooner*—that it did not go within sight of, or interfere with, any gentlemen's seats. Not only did goods from the westward go down to the place of distribution in Newcastle instead of having to go up to it, but they could be put immediately on board of a vessel instead of having to be transhipped into keels.

There was a stiff parliamentary fight for twenty days, but, on the 1st of May, the bill was read a third time in the House of Commons. On the 2nd the Company came to an arrangement with Mr. Bacon. On condition that the Company would pay him the sum of £3,000 and prevail upon Mr. Jacob Wilson, of Alston, to dispose of a portion of a field intersected by the railway to Captain Bacon Grey, Mr. Bacon entered into an engagement to offer no further opposition to the bill, to forego the clause compelling the Company to raise a mound of earth, and to let them have seven acres of his land.† The bill had a smooth passage through the House of Lords and received the royal assent on the 22nd of May, 1829.

By this Act the Company were empowered to construct 63 miles of railway,—the main line from the west end of the Close, Newcastle-upon-Tyne, to the north-west corner of the Canal Basin at Carlisle, and a branch line from Elswick Dene to Thornton Street, Newcastle-upon-Tyne, the latter not to be made without the consent of John Hodgson, of Elswick. The capital authorised was £400,000; £300,000 to be raised in shares and £100,000 by loan. Until the passing of the London and Birmingham Act, this was the longest railway sanctioned by Parliament. The Company were restricted to the use of horsepower by clause 6:—"No locomotive or moveable steam engine shall be used on the said railways or tramroads for drawing waggons or other carriages, or for any other purpose whatsoever; and no steam engine shall be erected or used for any of the purposes aforesaid, within view of the Castle of Naworth or Corby Castle, or of the several mansion houses of Charles Bacon, Esq., at Styford; of John Hodgson, Esq., at Elswick; of James Kirsopp, Esq., at the Spital; of Robert Pearson, Esq., at Unthank; and of Nicholas Leadbitter, Esq., at Warden, or any of them; nor within the distance of one thousand yards to the east of Stella Hall, nor nearer, on the west, than the point where the line of the said railways or

* *Minutes of Evidence on the Newcastle and Carlisle Railway Bill*, 1829, p. 179.

† Speech by John Clayton, *Tyne Mercury*, 7th April, 1835.

tramroads will be intersected by a certain common highway called the Water Lane." Clause 9, which debarred the Company from building depôts within the barony of Gilsland, secured to the Earl of Carlisle a monopoly of the sale of coal and lime between Low Row and Corby.*

Like the Stockton and Darlington and the Clarence Railways, the Newcastle and Carlisle Railway was intended to be open to the public on the payment of certain tolls. These tolls approximated to the actual charges of the Stockton and Darlington Railway, which were much below the authorised tolls. This will be seen by a few examples:—

	Stockton and Darlington Railway.		Newcastle and Carlisle Railway.
	Tolls Authorised.	Tolls Charged.	Tolls Authorised.
Coal for home consumption	4d.	2½d.	1½d.
Coke	4d.	2½d.	2d.
Lime	4d.	1¾d.	1½d.
Bricks	4d.	1½d.	2d.
Lead	6d.	1½d.	2d.
Timber	6d.	1½d.	1½d.
Manures	4d.	1d.	1d.
Building Stone	4d.	1½d.	1½d.
Corn	6d.	1½d.	2½d.
Grain			
Flour			
Hay			

Coal did not play so prominent a part in the establishment of the Newcastle and Carlisle Railway as in that of the Stockton and Darlington and Clarence Railways. It was from general merchandise that the Company expected the bulk of their revenue. The goods classification of modern times, which Mr. Henry Tennant once described as "very much like the British Constitution," having grown up and been altered from time to time to meet the circumstances of the trade of the country,† originated in this tentative grouping, for legislative purposes, of the principal articles of merchandise and of minerals, and therefore one turns with some interest to the classification in the Act of the longest, if not the most important, of the early lines. There were five classes: the first comprising all kinds of manures (including lime) and road-metal; the second, coals, lime (used otherwise than as

* The monopoly existed until 1880, when the restriction was withdrawn.

† Parliamentary Select Committee on Railways, 1881, Qn. 14,884.

manure), iron-stone, iron-ore, and all other mineral ores, timber, deals, building, pitching and paving stones and clay; the third, coke, culm, charcoal, flags, bricks, tiles and slates, lead, iron and other metals; the fourth, corn, grain, flour, hay and all other agricultural produce; the fifth, sugar, dye-woods and groceries, cotton and other wool, hides, drugs, manufactured goods and all other wares, merchandise, matters and things. The tolls authorised were respectively 1d., 1½d., 2d., 2½d. and 3d.

For conveying goods, themselves, the Company might charge, in addition to the tolls for the use of the railway, the following rates for the whole distance:—For all lime, limestone, iron-stone, iron-ore and other mineral ores, manures, building stone and road-metal, sand, clay, tiles and slates, timber, staves and deals, 12s. (=2⅓d. per ton per mile); for sugar, corn, grain and flour, dye-woods, lead, iron and other metals, 14s. (=2⅞d. per ton per mile); for cotton and other wool, drugs, groceries and manufactured goods, 16s. (=3⅓d. per ton per mile); for all wines, spirits, vitriol, glass and other hazardous goods, 20s. (=3⅞d. per ton per mile); for all coal, coke, culm, charcoal and cinders, 3d. per ton per mile.

On every passenger conveyed along the line they had power to levy a toll of 6d. for 5 miles, 1s. for 10 miles, and so on, up to 5s. for the whole distance. On every horse, mule, ass or other beast of draught or burden, on every ox, cow, bull or neat-cattle, 2s. 6d. for 15 miles, 4s. for 40 miles and 6s. for any distance beyond 40 miles; on every calf, sheep, lamb or pig, 9d. for any distance.

The Company were empowered, when acting themselves as the carriers, to make a reasonable charge for conveying “persons, cattle and other animals.” They were allowed, also, to charge pontage in respect of a roadway which they might make over Wetheral Bridge for the use of horses, carriages, cattle and foot-passengers.

Though the Act was theirs, despite the array of professional talent which had been brought against them, the Company felt that, before beginning the work, it would be desirable to have the Parliamentary line examined by an engineer unconnected with any party. They, therefore, employed Mr. Francis Giles, of London, to go over the line and report upon it. His opinion was highly favourable: one improvement only could he suggest—a diversion of the line between Scotswood and Ryton, in order that it might pass through Lemington and Newburn, instead of through Blaydon.*

* *Second Report on the line of railway from Newcastle to Carlisle, 19th August, 1829; Report on the improvement in the line of railway between Scotswood and Ryton, so as to pass through Lemington and Newburn instead of through Blaydon, 11th September, 1829.*

Another alteration was suggested by a "Holder of Ten Shares" (Joseph Price?), who, in a letter to the shareholders dated the 14th of October, 1829, protested against the railway being taken along the north side of the river at all, pointing out that, by making Gateshead the eastern terminus and keeping on the south side they would avoid the expense of a bridge and of a quay built upon piles for the greater portion of the way. Goods, which, at the Skinner burn, it would be necessary to tranship into keels and small craft, could be put into vessels below bridge directly from the waggons.

With these questions to be decided, the shareholders held their first general meeting on the 16th of October. Having the longest authorised line and the most voluminous Railway Act, they proceeded to elect the largest board of directors. The following is a list of the members of the board, which comprised two earls, and four members of Parliament:—The Earl of Carlisle, Lord Durham, Lord William Powlett, M.P., the Mayor of Newcastle, George Anderson, Thomas Richard Batson, Thomas Wentworth Beaumont, M.P., Matthew Bell, M.P., John Brandling, Job James Bulman, Nathaniel Clayton, Christopher Cookson, John Blenkinsopp Coulson, Joseph Crawhall, Thomas Crawhall, John Dixon, Peter Dixon, Thomas Fenwick, John Forster, John Forster, junr., Alfred Hall, Henry Howard, James Loch, M.P., James Losh, William Losh, George Gill Mounsey, Matthew Plummer, Benjamin Thompson, Thomas Wilson and William Woods.* James Losh was the first chairman and Thomas Crawhall the first secretary. Francis Giles was appointed the engineer and John Blackmore was afterwards engaged as resident engineer.

The works of the railway were begun in March, 1830, at the west end, between Blenkinsopp and Carlisle. The formal ceremony in connection with the event took place on the 25th of that month, when the first stone of the viaduct over the Eden was laid by Henry Howard of Corby.† It had been the intention of the directors to break ground at both ends, but there was still a difference of opinion as to the way in which the railway should be carried beyond Scotswood. A report on the "comparative qualities" of the two rival lines was made by Mr. Giles on the 22nd of June, and in doing so, he suggested that if the line by Lemington were adopted it might be desirable to construct a single railway as a branch from Crawcrook Mill to Blaydon, and afterwards to extend it to Gateshead, by which means all the objects of the trade on both sides of the Tyne would be answered.‡ Mr.

* *Northern Year Book*, 1829, p. 161.

† *Tyne Mercury*, 30th March, 1830.

‡ Report upon the comparative qualities of a line between Scotswood and Crawcrook Mill by way of Blaydon, and between those points by way of Lemington, 22nd June, 1830.

Beaumont's lead refinery was at Blaydon, and as considerable quantities of lead were expected to come down the railway from the Allendale mines, it was evident that the question of the course of the line could not be determined solely by engineering considerations.

The terminus of the railway was fixed, for the time being, at Blaydon, and, on the 28th of June, the works of the eastern portion of the line were begun at Wylam Hagg Bank.* The first sod in the western section had been turned in the reign of George IV.: it was in the reign of William IV. that the ground was broken in the eastern section.

The other scheme for connecting the two seas, at a broader part of the island, made little headway between 1825 and 1828. The Liverpool and Manchester line had been authorised and was in progress, but the Manchester and Leeds and the Leeds and Hull Railways were in a state of arrested development. The commercial difficulties in which the country was involved in 1825 had put a stop to the undertaking, and, when these difficulties were removed, the desire to profit by the experience of railways already or nearly in operation kept them from taking a further step forward. Besides, the communication between Leeds and Hull had been considerably improved by the opening of a canal between Ferrybridge and the new port of Goole on the 20th of July, 1826. Fly-boats, towed by horses, plied regularly between Leeds and Goole with goods and between Knottingley and Goole with passengers, and steam-packets ran in connection with them between Goole and Hull.

The Hull shareholders, alarmed at the establishment of the Port of Goole and the inauguration, on the 6th of April, 1828, of its foreign trade, were the first to take action. They were really face to face with the question whether the intercourse between Leeds, the great emporium of the woollen manufacture in the North of England, and Hamburg was to be carried on through the port of Goole or through the port of Hull. At a meeting held on the 11th of December, they passed a resolution to carry into effect so much of the original plan as related to the forming of a railway from Leeds to Selby and to accelerate the traffic from that port by means of steam-packets. On the 4th of March, 1829, the Leeds Committee acquiesced in this proposed limitation of the railway and, on the 20th, at a general meeting of the shareholders held in the West Riding town the Leeds and Selby Railway Company was definitely formed.

* *Durham County Advertiser*, 3rd July, 1830.

To the line surveyed in 1825 under George Stephenson's direction, there were great objections: it had three inclined planes upon it, which were intended to be worked by stationary engines—two of these planes descending towards Selby and one towards Leeds—moreover, it crossed some of the turnpike roads on the level and, on this account, would meet with the opposition of the road trustees.

Another engineer—James Walker—was therefore called in to examine and report upon Mr. Stephenson's line. A careful survey of the country having been made by his assistant, Alexander Comrie, between April and June, Mr. Walker drew up a report, dated the 18th of July, in which he recommended a line of railway differing in several points from that of 1825. The Leeds end of the line was transferred from Farbank to Marsh Lane in order to obtain a better approach to the town and to avoid interfering in any way with the works of the Aire and Calder Navigation Company; the Selby end, instead of being close to the bridge over the Ouse, was placed 260 yards below it with the object of securing a good frontage upon the river, and sites for buildings and depôts. None of the gradients exceeded 1 in 135 and the line throughout was adapted either to horses or locomotive engines. It passed over the main roads on bridges. The engineer got rid of the inclined planes, at the cost of tunnelling through Richmond Hill, near the Leeds end. The line of 1829, though diverging slightly from that of 1825, did not exceed it in length by a hundred yards, the distance between the two termini being 19 miles and 7 furlongs.*

The system of stationary engines, which Mr. Walker had recommended but a few months before to the directors of the Liverpool and Manchester Railway Company, he did not think suitable for the Leeds and Selby Railway, as the traffic expected would not be sufficient to keep the engines constantly at work. A meeting was held at Selby on the 31st of July, 1829, to examine the two plans, George Stephenson being in attendance, and the various points of difference between the plans having been considered, Mr. Walker's line was unanimously adopted. The following session a bill was brought before Parliament. It was opposed by the Dowager Marchioness of Hertford, Sir Charles Ibbetson, bart., of Denton Park, and other landowners, on the ground that the railway was unnecessary, there being every facility for communication between Leeds and Selby by water: they contended that the superiority of railroads over canals had not been practically proved and professed to desire the postponement rather than the rejection of

* *Report of the Committee of the proposed railway from Leeds to Selby, 1829, pp. 12-16.*

the measure.* But the most strenuous opposition came from the proprietors of the Aire and Calder Navigation, who had a monopoly of the carrying trade of the district and were not prepared to surrender it without a struggle. The value of the monopoly may be gathered from the fact that they were receiving at this time a yearly dividend of £70,000 on a capital of £26,700.†

The Leeds and Selby party argued that the railway was merely an improvement on the land conveyance already existing, that it would tend to the general prosperity of the district, and so indirectly benefit the navigation, seeing that heavy traffic at low speeds would still go by water. But the proprietors of the navigation were unable to consider the measure from the higher economic standpoint: they only saw in it an attack upon their interests. According to Mr. R. Fountayne Wilson, who participated in the Aire and Calder dividend to the extent of £9,321 19s. 0d. per annum, not only would their property be depreciated by the establishment of a railway, but the towns along the navigation would be destroyed: "they might," he added with tragic emphasis, "sit down and weep like the daughters of Babylon."‡

This picture of the direful effects of competition failed to arouse the appropriate emotions. The evidence in committee showed how factitious was the nature of the objections against the railway, and the bill passed the House of Commons on the 1st of April. The proprietors of the Aire and Calder Navigation then withdrew their opposition, and though the landowners renewed their attack on the bill when it reached the House of Lords, it was read a third time on the 11th of May and received the royal assent on the 29th.

This Act, which authorised the construction of the earliest of the lines comprised in the North Eastern Railway system at the time of the amalgamation, empowered the Company to raise £210,000 in shares and £90,000 by loan. The tolls sanctioned for the conveyance of goods, ranging from 1d. to 3d. per ton per mile, differed but little from those of the Newcastle and Carlisle Railway; they were somewhat higher for timber, deals, iron and lead, and lower for charcoal, bricks, tiles and slates.

The classes into which goods and minerals were assorted in the Newcastle and Carlisle Act were five in number; in the Leeds and Selby Act, four. The gauge of the railway, like that of the Middlesbrough branch of

* Minutes of Leeds and Hull Railway Committee, 4th March, 1830.

† Parsons' *Tourist's Companion from Leeds through Selby to Hull*, 1835, p. 130.

‡ Minutes of Leeds and Hull Railway Committee, 4th March, 1830.

the Stockton and Darlington Railway, of the Clarence and the Newcastle and Carlisle Railways, was fixed by Parliament; the width between the inside edges of the rails had not to be less than 4 feet 8 inches and between the outside edges more than 5 feet 1 inch.

The first general meeting of the Company was held at Selby on the 16th of July, 1830, when the following directors were elected:—James Audus, Edward Baines, Thomas Davison Bland, John Broadley, Richard Oliver Gascoigne, Benjamin Gott, Robert Harrison, John Marshall, junr., John Cowham Parker, the Hon. Edward Robert Petrie, John Scholefield and John Wilson. The chairman selected was John Broadley, the vice-chairman was Benjamin Gott.*

The contract for the first two miles of railway from Leeds, including the tunnel, was let on the 25th of September to Messrs. Nowell & Sons, of Dewsbury, for £25,244, and ground was broken on the 1st of October,† but a railway intended to form a junction with the Leeds and Selby line having been projected from Bradford to Leeds, the directors saw an opportunity, by means of an arrangement with the new Company, of transferring their station at Marsh Lane to a more central part of Leeds—School Close—and consequently of doing away with the tunnel.‡ Operations were therefore suspended for some months until the question of the Leeds terminus had been settled.

The contract for the remaining 18 miles of railway from Osmondthorpe to Selby was let on the 16th of December to Messrs. Hamer & Pratt, of Goole, for £83,300.§

As it was very uncertain whether the Leeds and Bradford bill would pass, the directors decided to adhere to the parliamentary line, and the works of the first public railway in the neighbourhood of Leeds were actively begun in the last week of February, 1831, at the upper end of Marsh Lane.||

Meanwhile, the great scheme of connecting the western with the eastern sea was kept prominently in view. At this very time parliamentary sanction was being solicited for a railway between Leeds and Liverpool which had been projected to form, in conjunction with the Leeds and Selby

* *Leeds Mercury*, 17th July, 1830. Mr. Scholefield having declined to act, Mr. Samuel Wilks Waud was, on the 25th of August, appointed in his stead.

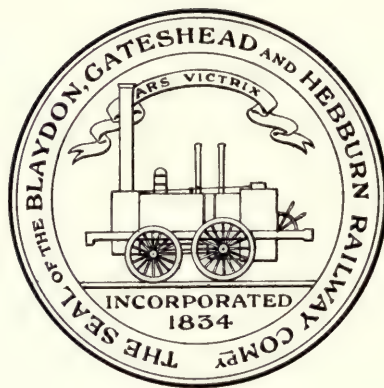
† *Ibid.*, 20th September, 1834.

§ *Ibid.*, 18th December, 1830.

‡ *Ibid.*, 6th November, 1830.

|| *Ibid.*, 26th February, 1831.

Railway, a four-lined track between the Mersey and the Humber through the coal-fields of Lancashire and the cloth district of the West Riding of Yorkshire. In connection with this scheme it was proposed, in order to facilitate travelling by night, to light the whole line with gas.* The Manchester and Leeds project which had again been brought forward was also occupying the attention of Parliament.



* *Durham Chronicle*, 21st April, 1831.

CHAPTER VII.

TOWARDS THE PORTS OF THE NORTH EAST COAST.

Within less than two years from the passing of the Leeds and Selby Act, there were ten schemes before the public for new railways in the North of England: these, with two exceptions, were connected with the Ports of the North East Coast. The development of the Tees, the establishment of Seaham, and the rise of Goole showed how indispensable to the ports were railways or canals. The Tyne and Wear vied with each other in the promotion of new lines. Hartlepool and Whitby also, remembering their ancient glories, shook off the lethargy of years and roused themselves to participate in the benefits of railway enterprise.

The earliest of these schemes originated at North Shields. It was for a railway along the riverside, commencing at Newcastle by a tunnel from the east side of the Stock Bridge, near the foot of Pandon Bank, and terminating, by another tunnel, at the Wooden Bridge, North Shields, with branches to intended shipping-places—one to the Low Lights, and another to the Lime Kiln Shore.* With what must seem undue haste—for the line had not been surveyed—the promoters gave notice in October, 1830, of their intention to bring the measure before Parliament in the following session. Meanwhile, the public were invited to consider the claims of another line, commencing at the Shield Field, Newcastle, and crossing the Ouseburn by a lofty viaduct.†

On the 9th of November appeared the parliamentary notice of a project for a railway on the south side of the river, from Blaydon through Gateshead to South Shields and Monkwearmouth. It had been in contemplation for some years, but deferred until the question of the eastern terminus of the Newcastle and Carlisle Railway had been settled. Now it was forced forward by the action of the North Shields party. No time was lost in bringing the advantages of these rival schemes before the public. The supporters of the line on the north side held a meeting in Newcastle on the

* *Tyne Mercury*, 26th October, 1830.

† *Ibid.*

13th of November,* and those of the line on the south side, in Gateshead, on the 18th.† Both were equally unprepared with plans and estimates, and, while the general principle of a railway communication between the points indicated met with approval, no precise line could be adopted. An enlargement of the scope of the original design was sanctioned at the second meeting of the Newcastle and North Shields party, held on the 17th of December—this was the connection of the line with the Newcastle and Carlisle Railway.‡

This scheme for a railway between Newcastle and North Shields was not allowed to go forward without opposition. “One of the old school”§ argued that the railway would throw out of work many thousands of persons—he called it “a poverty-producing measure”—and that, by reducing the number of men employed on the river, it would weaken the maritime forces of the country in case of war; that, on account of the cheap transport of goods by the aid of steam, it would not be necessary for many ships to go to Newcastle to take in and deliver their cargoes, consequently Newcastle would lose some of its importance and the Custom House might eventually be removed to North Shields. Landowners, deriving a revenue from way-leaves, the proprietors of gigs, coaches and steam-packets, and the road trustees, had interests which they thought would be affected prejudicially by the railway. North Shields tradesmen objected to the railway on the ground that it would induce the inhabitants of the town to do their shopping in Newcastle. Tynemouth lodging-house keepers asserted that a business man would never think of taking rooms in the village when he could go down by train and bathe and be home again at breakfast. One writer burlesqued the idea of a railway, humorously proposing to utilise the old colliery workings and make a kind of two-penny tube, illuminated by gas, between Newcastle and Tynemouth, in which passengers could be conveyed from end to end in ten-and-a-half minutes for 2d. first class and 1½d. second. With mock seriousness he represented that, on this line, there would be no annoyance from heavy rains, no impediment from wind and ice, no stoppage from snow, no exposure to weather. There would be an equable temperature at all seasons of the year, similar to Tivoli in Italy, on which account it was proposed to call the line the “Newcastle, North Shields and Tynemouth Tivolian Railway.”||

* *Tyne Mercury*, 16th November, 1830.

† *Ibid.*, 23rd November, 1830.

‡ *Ibid.*, 21st December, 1830.

§ *Ibid.*, 4th January, 1831.

|| *Ibid.*, 10th January, 1831.

Early in January, 1831, appeared a pamphlet* by Joshua Richardson, the resident engineer of the Leicester and Swannington Railway, supplying the data so much needed. Having ascertained that there were 11 coaches, 25 gigs and 36 steam-packets travelling between Newcastle and North Shields in summer, and 9 coaches, 25 gigs and 33 steam-packets in winter, he calculated that the number of passengers conveyed yearly was, according to the highest estimate, 896,360, and according to the lowest, 478,250. The quantity of goods carried by wherries, "comfortables" (covered passenger boats), keels, steamboats and carts he estimated at 15,682 tons. As the revenue from passengers was expected to be eight times as much as that from goods, it was evident that the line would have to be planned with reference to the more lucrative class of traffic. The high line, therefore, commencing at Newcastle, either at the Shield Field, the Barras Bridge, Albion Place or the West Gate, and, in its course, passing near to Jesmond, behind Heaton Hall, over Willington Dene, not far from the Church Pit, and by way of Chirton to North Shields and Tynemouth, seemed to Mr. Richardson the more eligible one. He considered it might be expedient for the Company to limit their powers to the conveyance of passengers and parcels, and to restrict themselves, by a clause in their Act, from carrying coals, except for home consumption, from any of the collieries then working and having private lines.

With this pamphlet before them, demonstrating the advantages and practicability of the proposed railway, the promoters opened a subscription on the 18th of February, 1831. Immediately afterwards, in accordance with a resolution passed at the meeting, Robert Stephenson and Joshua Richardson made a survey of the district, recommending a general railway for passengers and merchandise, to begin at the Stock Bridge—a point more convenient for effecting a junction with the Carlisle Railway than Shield Field—to proceed up Pandon Dene under the east arch of the new bridge over the Ouseburn in order to go behind Heaton Hall, and to terminate near the Bull Ring, at the west end of North Shields.† The plan and report were discussed at a meeting held on the 27th of August, and again on the 3rd of September, but conflicting views with regard to the course of the line brought the project to a standstill.

* *Observations on the proposed railway from Newcastle-upon-Tyne to North Shields and Tynemouth.*

† *Tyne Mercury*, 30th August, 1831.

On the south side of the river, as on the north side, there were divided counsels, and the Blaydon and Gateshead scheme, brought forward in August, 1831, drew off from the Blaydon, South Shields and Monkwearmouth scheme some of the support which would otherwise have been given to it. On the 27th September, at a meeting in Gateshead, over which Sir Thomas J. Clavering presided, a company was established with a capital of £50,000 for the purpose of forming the railway, Joshua Richardson being appointed engineer.* The line of railway was intended to run from Blaydon Lead Mill, past Dunston and Redheugh, and to pass by a tunnel under Gateshead, ending at the river, near the Rope Walk.†

The new project met with a chilling reception from the Newcastle and Carlisle Railway Company, who appear themselves to have been contemplating at this time the formation of a branch from Blaydon to Gateshead.‡ Subscribers hung back, and the intended application to Parliament, of which the promoters gave notice on the 25th of October, was never made. For two years afterwards the Newcastle and North Shields and the Blaydon, South Shields and Monkwearmouth promoters remained inactive, awaiting developments.

The rivalry between the Tyne and the Wear had brought into notice the importance of South Shields. This town, which existed where, according to the plea of the old Corporation of Newcastle, "no town ought to be," held the key of the situation. This position, by a sort of dramatic justice, it owed to the policy of the Corporation of Newcastle, which, for so long a period, had diverted the river dues from the purposes of conservancy and improvement to its own coffers. With the river full of shoals and sandbanks, the inevitable termination of the great line of railway from Carlisle was South Shields. South Shields was also the natural outlet for a large area of the Durham coal-field. While the project of continuing the railway from Blaydon to the mouth of the Tyne was in agitation, another scheme was brought forward to connect South Shields with Monkwearmouth. The principal object of this measure, according to certain petitioners against it, was to "detach the coal trade from the port of Sunderland."§ The proposed line, as surveyed by Mr. T. O. Blackett, was to commence at South Shields on the west side of the burial ground of St. Hilda's Chapel, and near Messrs. Cookson & Co.'s Glass Works, and to terminate at or near the

* *Tyne Mercury*, 4th October, 1831.

† *Ibid.*, 16th August, 1831.

‡ *Newcastle Courant*, 8th October, 1831.

§ *Sunderland Herald*, 28th January, 1832.

Wheat Sheaf Inn, Monkwearmouth. There were to be two short branches, one from Cookson's Brick Yard, near Commercial Road, South Shields, to the Tyne near East Holborn, the other from a point near the Monkwearmouth terminus to the river Wear on the west side of Reath or Garrett's Quay.* By the 24th of August, 1831, the promoters had decided to go to Parliament, and a bill was accordingly introduced the following session.

In Sunderland the dominant feeling at this time was jealousy of the Tyne, and, to improve the position of the port, it was considered desirable to have a wet dock on the Wear. Opinions, however, differed as to the most eligible site for it. Two parties were formed, one for the purpose of promoting a dock on the north side, and another for the purpose of promoting a dock on the south side of the river. The north dock party, of which Sir Hedworth Williamson was the moving spirit, proposed to connect the collieries on the south side by means of a suspension bridge (estimated by the engineer, the younger Brunel, to cost £22,000) and a short line of railway, 1 mile 1 furlong in length; but public sentiment opposed the project of a bridge on the ground that it would afford facilities for the transportation of the best coals to South Shields. The Newcastle Corporation, it was declared, were so desirous of getting these coals that no expense would be spared in extending branches from the railway to the Tyne.† Parliament was asked to consider the claims of the two docks in the same session as it dealt with the South Shields and Monkwearmouth Railway Bill. The railway measure was violently opposed by Mr. Bryan Abbs, of Cleadon, and other landowners, and a committee of the House of Commons, having sat upon the bill three days, threw it out on the 14th of March, 1832, by a majority of one.‡ The Dock Bills shared a similar fate, one being rejected by the House of Commons and the other by the House of Lords. Two years later, "the pre-eminence of the Tyne in the coal trade" was considered by Mr. John Clayton, the sagacious town-clerk of Newcastle, "as based on adamant."§ For this position the river was indebted to a bold and remarkable scheme which had its inception in 1831.

In the early part of this year, Pontop Colliery (which had been worked by the Marquis of Bute) and a landsale pit at Medomsley were advertised

* *Tyne Mercury*, 15th November, 1831.

† *Minutes of Evidence on the Wearmouth Dock Bill*, 1832, p. 177.

‡ *Sunderland Herald*, 24th March, 1832.

§ Speech at opening of the Stanhope and Tyne Railway. *Newcastle Journal*, 13th September, 1834.

to be let.* The eligibility of this district as a field for enterprise struck William Wallis, of Westoe. On the 20th of November he contracted with John Selby for a lease of coal-seams under his property at West Consett, and on the 2nd of December, entered into partnership with Cuthbert Rippon, of Stanhope Castle, and William Harrison, of Monkwearmouth Grange, for the purpose of working coal at Medomsley and limestone at Stanhope—a project which involved the construction of a railway between these two places.

Of the Company thus formed, William Harrison became the leading spirit. Twenty years previous to this date he had been concerned, as a member of the firm of Harrison, Cooke & Co., in the formation of the Bewicke-main waggonway (see p. 18) and in the working of the Urpeth, Leefield and South Heaton Collieries.† In 1817, having acted as an intermediary in a negotiation between the owners of Fawdon Colliery and a capitalist at Sunderland for the making of a waggonway from the colliery to the Tyne at Scotswood, he had been admitted to a share of the profits of the undertaking, which during the eight years of its existence, were enormous.‡ To his connection with the Fawdon waggonway, which had been managed on behalf of the lender, the owners of the colliery paying a rate per chaldron, must be attributed his interest in the promotion of this similar, but incomparably greater, scheme in the county of Durham. From Medomsley it was intended, according to the original plan, to convey the coal and lime of the Company to the Tyne above bridge by way of the Derwent,§ probably down the old Pontop waggonway (see p. 11), a part of which it would have been necessary to re-lay; but this idea was soon abandoned in favour of a much more daring project—originating with William Harrison||—that of forming a railway from Stanhope to some point on the Tyne below bridge.

Instead of applying to Parliament for the usual compulsory powers,

* *Newcastle Courant*, 5th February, 1831.

† This firm became involved in 1811, and it was to manage Urpeth Colliery on behalf of the assignees that Benjamin Thompson came down to the North where he played so leading a part in the development of the railway system.

‡ Printed letter from Benjamin Thompson on "Messrs. Newmarch and Fawdon Colliery," 26th October, 1840.

Printed letter from Thomas Newmarch to Benjamin Thompson, 17th November, 1840.

§ Russell Bowlby; *Wallis v. Stanhope and Tyne Railway*. *Durham Advertiser*, 12th March, 1841.

|| Letter from William Wallis to Russell Bowlby, 24th January, 1832, cited by Mr. Dundas. *Sunderland and Durham County Herald*, 12th March, 1841.

it was proposed to make voluntary arrangements with the landowners for way-leave. Keeping their ulterior object a secret, lest it should impede their acquisition of the Pontop and Medomsley coal-fields and also raise difficulties with respect to the way-leaves, the newly-formed Company opened negotiations, on the 2nd of December, 1831, with the Dean and Chapter of Durham for permission to pass through their ground on Muggleswick Common and the enclosed lands of their tenants there, for the purpose of making a railway for "general purposes." A survey was then made for a line between Stanhope and Medomsley, the engineer employed being Thomas Elliot Harrison, the son of one of the projectors, who, as the first general manager and for thirty-five years the chief engineer, stands out such a typically representative figure in the history of the North Eastern Railway.

The line was probably intended at first to go by way of Consett to Medomsley, but in January it was diverted, after leaving Muggleswick Common, to the east of Cold Rowley.* John Fairweather Harrison, of London (William Harrison's brother), and Thomas Barnard, of Deptford, having joined the little band of projectors, Russell Bowlby, the solicitor, on the 30th of January, prepared a deed of partnership under the title of the "Stanhope Railroad Company." On the 11th of February Mr. Rippon withdrew from the partnership and on the 30th of March Mr. Wallis also retired, surrendering his interest in the concern for a bond of £3,000 to be paid on the completion of the railway.†

The project was now in the hands of the Harrisons and Thomas Barnard. On the 9th of April, 1831, these gentlemen entered into an agreement with Charles Smythe for a lease of Pontop Colliery and, on the 19th, with Cuthbert Rippon for a lease of his limestone quarries in the neighbourhood of Stanhope; the terms on which these were granted being a certain rent of £1,300 per annum for the privilege of working and leading 1,625 tens of coals (78,948 tons) out of Lanchester Common, and £2,000 for the privilege of burning, selling and carrying away 30,000 tons of lime, together with a "tentale" rent of 16s. for every ten of coals and 1s. for every ton of lime worked and led above these quantities.

* William Wallis to Thomas Davison, 17th January, 1832. *Durham Advertiser*, 12th March, 1841.

† Russell Bowlby's evidence, *Wallis v. Stanhope and Tyne Railway*. *Durham Advertiser*, 12th March, 1841. Mr. Wallis afterwards agreed to accept £2,000 down in lieu of £3,000 on the completion of the railway, and executed a release of the bond on the 16th of July, 1832.

The new partnership commenced on the 20th, with certain rights and interests in leases but practically no funds. Men of credit and wealth, however, most of them residing in London, were found willing to subscribe to the undertaking, and a company was formed under the title of the "Stanhope and Tyne Railroad Company" with a capital of £150,000 to take over the rights and interests of the partnership. By the arrangement made with the Company, and subsequently confirmed in a deed of settlement, the projectors were to have, in certain proportions, one moiety of the clear net annual profits of the concern, after a dividend of 5 per cent. had been paid, viz. :—

J. F. Harrison	...	...	...	$\frac{11}{40}$ ths.
W. Harrison	...	...	...	$\frac{20}{40}$ ths.
T. Barnard	...	...	...	$\frac{9}{40}$ ths.

this arrangement, however, being subject to the power to set apart a portion of such profits as a reserved fund. It was also stipulated that 500 reserved shares should be allotted to J. F. Harrison and T. Barnard, who were to pay them up by instalments at the rate of 50 per year.

The first board of directors, which met on the 1st of June, 1832, at the offices of the Company, 26, New Broad Street, London, consisted of Edward George Barnard (chairman), Edward Blount, John Wright, John Fairweather Harrison, William Harrison, Thomas Barnard, Antonio Joaquim Freire Marreco.*

Early in July the ground was broken at the Stanhope end and the works, which comprised between three and four hundred feet of tunnelling, made rapid progress, with Robert Stephenson as consulting and Thomas E. Harrison as acting engineer. By the beginning of October, the directors were ready to proceed with the formation of another portion of the line—between the Hownes and Healeyfield, and to receive tenders for 3,000 tons of rails and a suitable quantity of chairs. A month later they had let the contract for four engine houses.

The works of the railway being in active progress, the Company proceeded, under the advice of John Buddle, the celebrated mining engineer, to re-open their collieries which, for many years, had lain dormant.

The greater part of the country between Stanhope and Medomsley consisted of commons, the property of the Bishop and Dean and Chapter of Durham, and the Company passed over these wastes on comparatively moderate terms, the Bishop of Durham having granted a right of way over

* Deed of settlement, 3rd February, 1834.

Stanhope Fell ($1\frac{3}{4}$ miles) for £25 per annum, and the Dean and Chapter over Waskerley Park, Muggleswick Common, and a farm called White Hall, for £160 per annum, which averaged £26 per mile, or from £4 to £5 per acre. But, when they came to make wayleave agreements for the eastern portion of the line, their ulterior object was no longer a secret, and the difficulties which they experienced in bargaining with the landowners were even greater than they had anticipated. The terms of the Dean and Chapter for licence to pass through their leaseholds in the townships of Harton, Westoe and South Shields, a distance of over $2\frac{1}{2}$ miles, were £510 per annum (at the rate of £200 per mile) and double the annual value of the land to the tenants for surface damage, equivalent in that neighbourhood to nearly £100 a mile more; with a stipulation that, if the owners of any colliery, having a wayleave through the lands of the Bishop or Dean and Chapter, should divert their coals to the Stanhope and Tyne Railway, they were still to pay the ecclesiastical rents, though no longer exercising the right of wayleave.* A twenty-one years' lease was all that the Dean and Chapter could grant, and as it contained no covenant for renewal, a company which had embarked a large capital in the construction of a railway could only claim the renewal on equitable grounds.

The Bishop's terms for a way-leave over Lanchester and Chester Commons, a distance of 7 miles, were £400 a year, but, in authorising them to lay a railway over the allotments on Lanchester Common "for the conveyance of lime, coal, manufactured goods or any other substances or merchandise for a term of 21 years," he exceeded his powers. By a clause in the Lanchester Common Act of 1773, certain rights were reserved to the Bishop. He was entitled to grant a way-leave over the lands enclosed under the Act for the coals and minerals got within or under those lands as well as for those got out of any other mines belonging to the See of Durham, but not for the coals and minerals which might be brought from other royalties.† Some of the commoners questioned his right to demise a way-leave over their lands for agricultural produce and general merchandise, and the Company, to prevent any dispute in the future, agreed to recognise their claim to compensation, the amount payable for way-leave and damage being left to the decision of referees.

No arrangements were made either with the commoners or the tenants

* *Minutes of Evidence on Church Leases*, 1838, Qn. 4,165.

† *Midgley v. Richardson*, Court of Exchequer, 9th July, 1845. *Fenwick and another v. Hedley and others*, Court of Exchequer, 25th May, 1863. *Law Journal Reports*.

of the Dean and Chapter for liberty to carry passengers over their lands. The railway did not pass through any town or village in its course, and, in fact, was not intended at this early period to be used for passenger traffic.* The agreements with the other great landowners were for £300 a mile, in the case of the owners of freehold land, for a term of 99 years. Even this amount did not satisfy some of the smaller proprietors. So unreasonable were their demands that the solicitor of the Company lost his professional equanimity. "It is enough to make a horse sick," he wrote, "to see parties, instead of blessing Providence for such a godsend, treating as if one was taking a road through a gentleman's pleasure ground."† Over 765 yards of very indifferent land near Hylton Bridge, the fee simple of which was not more than £30 or £40 and its annual value under 20s. an acre,‡ the Company obtained a way-leave at the rate of £350 per mile or £50 an acre. They had to pay £30 a year for passing over 66 yards of one farm at Boldon and £50 for passing over 110 yards of another, these rents being at the rate of £800 per mile.

By this voluntary arrangement with the landowners the Company had saved the cost of obtaining parliamentary sanction to a line passing over 17 miles of ecclesiastical land, and through the estates of noblemen so influential as the Marquis of Londonderry and Lord Durham. They were also relieved from the necessity of raising a large capital for the purchase of land, but they had saddled their undertaking with an annual rent charge of £5,600, equal to £40 or £50 a mile for the western half of the line and to £280 or £300 for the eastern half. In a country where between £2,600 and £2,700 a year was paid for way-leave in respect of one private line about 9 miles in length—the Hetton Railway—§ this amount may not, at the time, have seemed excessive. This, the first public railway to be formed on what the leading lights of the coal trade called the "legitimate principle,"|| comprised about $37\frac{3}{4}$ miles, viz.:—

* A district that afterwards became very populous was consequently deprived for sixty years of the benefits of railway travelling. When the Consett and Annfield Plain deviation lines were completed in 1885, it was hoped that a service of passenger trains would be established in the district, but Mr. Tennant was obliged to inform the Leadgate Local Board that the way-leave arrangements under which the railway was held did not provide for the running of passenger traffic, and though application had been made to the way-leave owners some of them seemed indisposed to grant the requisite powers.

† Russell Bowlby to Andrew Stoddart, 25th November, 1832.

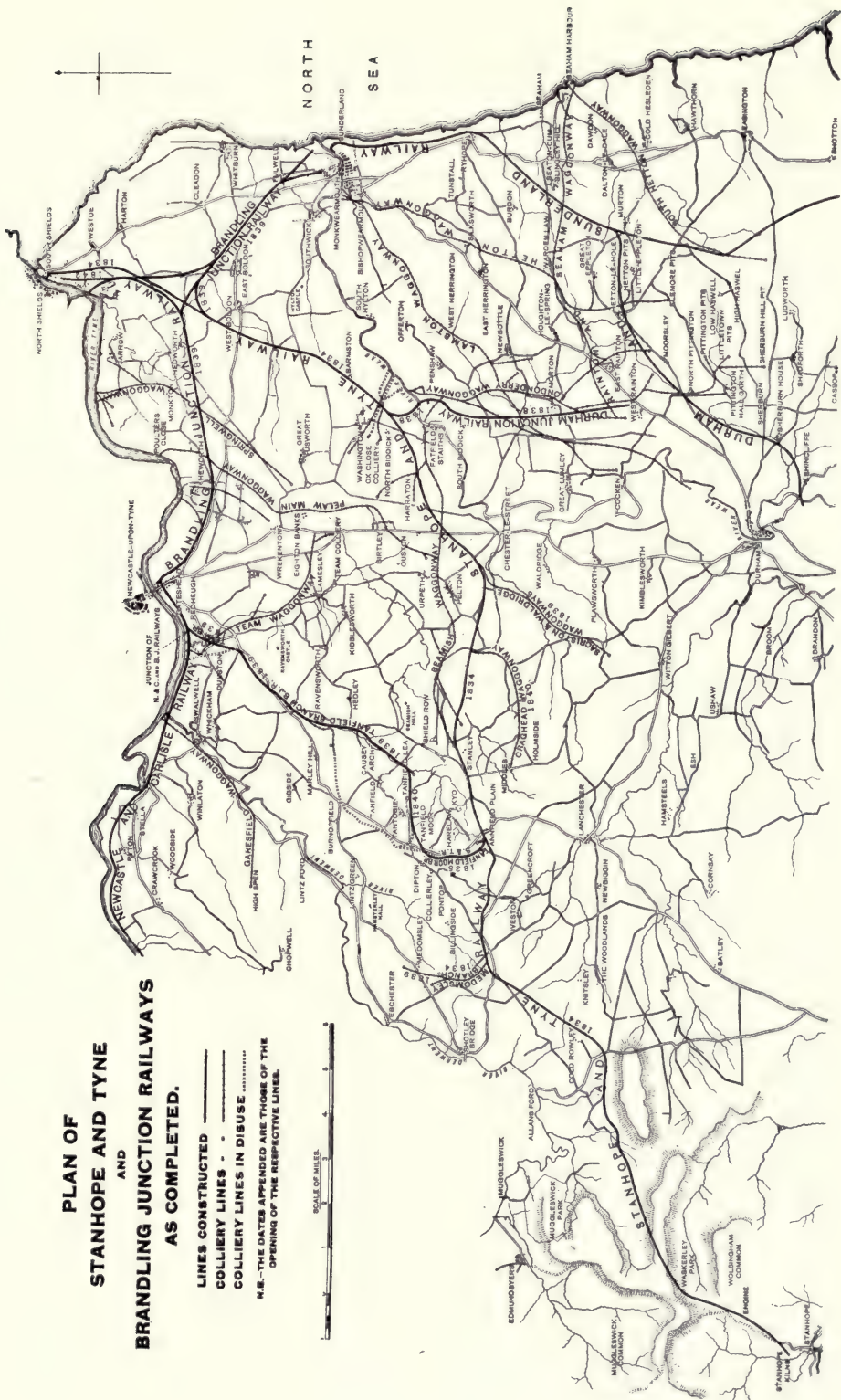
‡ Matthias Dunn. Evidence on South Durham Railway Bill, 1836, Qs. 1,271-1,282.

§ Thomas Wood. Evidence on South Durham Railway Bill, 1836, Qs. 2,046-2,047.

|| John Buddle. Evidence on South Durham Railway Bill, 1836, Qn. 1,801.

PLAN OF STANHOPE AND TYNE AND BRANDLING JUNCTION RAILWAYS AS COMPLETED.

LINES CONSTRUCTED —————
 COLLIERY LINES IN DISUSE - - - - -
 COLLIERY LINES IN DISUSE
 N.B.—THE DATES APPENDED ARE THOSE OF THE
 OPENING OF THE RESPECTIVE LINES.



	M.	F.	Ch.
Main line, from Stanhope Kilns to South Shields...	33	7	1
Medomsley branch 	1	3	5
Tanfield Moor branch (partly an old line which required to be re-laid) 	2	1	0
Stuart Pit branch 	0	2	0
	37	5	6

Surveys were made, after the works began, for important extensions: at the western end for a branch from Muggleswick Common, near the boundary currick called Moss Hole Stone (now Waskerley) to Thornley Pit Houses, near Tow Law—Mr. Rippon having entered into a contract with the Company to send down their line the produce of four collieries in that neighbourhood—at the eastern end for a branch from the Three Horse Shoes in Hylton Lane to Monkwearmouth. A prospectus was issued in 1833 for a railway, about 6 miles in length, from Thornley Pit Houses to the Stockton and Darlington Railway near Witton Park—the Tees, Weardale and Tyne Junction Railway, by which it was proposed to complete a great line of communication between South Shields, West Auckland, Darlington and Middlesbrough.

While the first steps were being taken to connect the limestone quarries of Stanhope and the collieries of the Pontop district with the Tyne, several coal companies were actively engaged in opening out a coal-field extending from Haswell and Easington to Shadforth and Cassop, including Thornley and Ludworth. For the produce of this coal-field, Hartlepool was the natural outlet. But the old harbour was in a state of dilapidation, being chiefly used as a place for the depositing of rubbish. So recently as 1808 it had been converted into a field by means of an embankment, and, where royal ships once lay moored, corn is said to have grown. An agitation in 1813, while it secured the removal of the obstruction, did not lead to any improvement in the harbour, which, in 1831, contained only from 3 to 4 feet of water at spring tides. In the scheme of 1823, to which reference has been made (p. 164), the intention was to construct drops between the bastion and the old pier, in front of the town walls, and to approach them by a timber viaduct across the Slake; but the depth of water at this point would not have exceeded 12 feet at a spring and 6 feet at a neap tide.

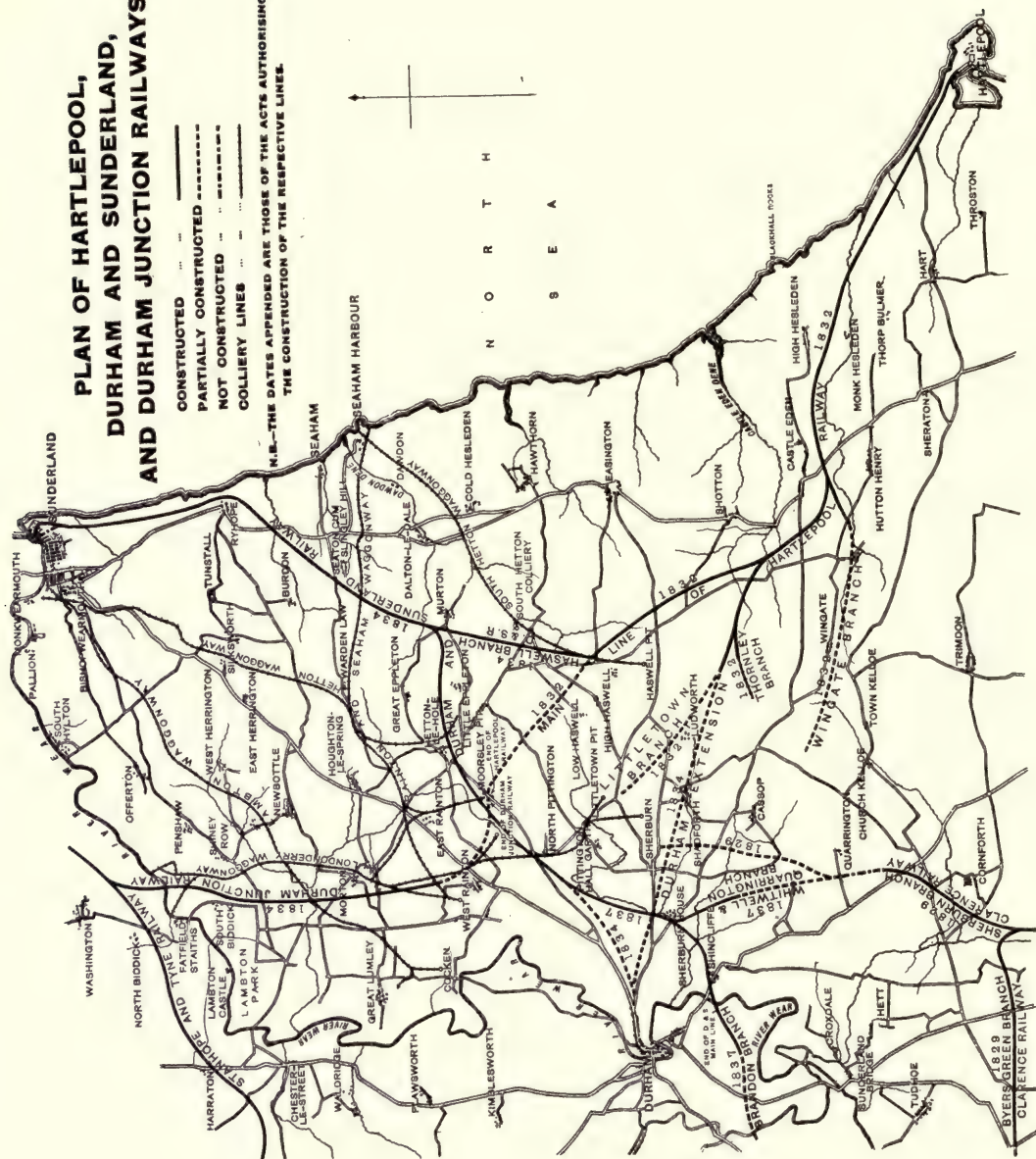
To Christopher Tennant, who had settled in the town, the natural advantages of Hartlepool as a coal-shipping port were evident, and when a project was started with the double object of improving the harbour and connecting it by a railway with the coal-field, he took it up with his customary energy. On the 18th of October, 1831, a meeting was held in Durham to consider the project and it was decided to have a survey made.* George Stephenson was consulted with regard to the railway, and he recommended a line commencing at the Moorsley Pit, belonging to the North Hetton Coal Company, passing by the Elemore Pits, belonging to the Hetton Coal Company, through the townships of Haswell and Easington, within a short distance of the new winnings at Haswell and South Hetton, to Castle Eden, and thence, through Hesleden, down to Hartlepool, with three branches—one to Little Town Pit, another through Wingate to Cassop, and a third from the Little Town branch—to Thornley. Sir John Rennie and Thomas Milton were consulted with regard to the harbour. The plans adopted embraced a threefold series of improvements. It was proposed (1) to convert the inner harbour into a dock and to form another dock on the west side of it, these having accommodation respectively for 170 and 280 ships; (2) to transform a portion of the slake—a sort of salt-water lake or lagoon—into a tidal harbour, deepening it to the extent of 4 feet below low-water mark; and (3) to utilise the remainder of the slake as a reservoir for cleansing and scouring the outer harbour and channel. A short cut was also intended to be made through the narrow neck of land on the west of the town, in order to connect the docks and harbour with the sea, at the bay to the north of Hartlepool called the Softleas.

It was important that an Act should be obtained in the ensuing session of Parliament, and the project was pushed forward with hot haste. Owing, however, to the delay in completing the subscription list to meet the requirements of the standing orders of the House of Commons, it was found necessary to cut down the estimates to the lowest possible point—against the better judgment, apparently, of George Stephenson. “For the Hartlepool Railway,” he said, when giving evidence on the Great Western Railway Bill, “I made out an estimate which they returned on account of its being too high. I declined to go to Parliament with a lower estimate.” A portion of the railway was altered from a double to a single line, the space to be excavated for a dock was confined to about 12 or 13 acres, reducing the estimate for

* *Durham Chronicle*, 22nd October, 1831.

PLAN OF HARTLEPOOL, DURHAM AND SUNDERLAND, AND DURHAM JUNCTION RAILWAYS.

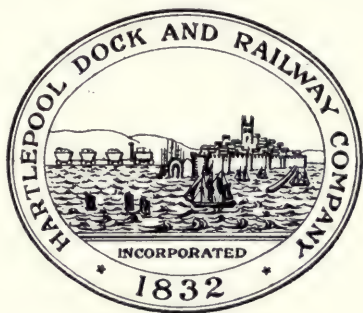
CONSTRUCTED ———
PARTIALLY CONSTRUCTED - - - - -
NOT CONSTRUCTED
COLLIERY LINES ———
N.B.—THE DATES APPENDED ARE THOSE OF THE ACTS AUTHORIZING
THE CONSTRUCTION OF THE RESPECTIVE LINES.



that portion of the works to £70,000 and making the total estimate upwards of £50,000 less than at first proposed.* A prospectus was issued on the 8th of December, 1831, and in the following February a bill was introduced into Parliament. It was opposed by one landowner only—William Gray, of Stockton, proprietor of the Middle Thorpe estate, who was finally bought off. The Corporation of Newcastle-upon-Tyne came forward at the last moment with a petition to the House of Lords against the bill on the ground that, as the coals shipped at Hartlepool would be exempt from the heavy impost of way-leaves to which the coals shipped in the Tyne were subject, the effect of the bill would be “to give to another Port an unfair and undue advantage over the river Tyne, long the principal Port for the export of coals.” In vain did they submit that there was no object of public advantage to justify what they termed “the violation of the rights of private property;” the bill was passed and received the royal assent on the 1st of June, 1832.

By this Act the Hartlepool Dock and Railway Company were empowered to make $23\frac{1}{4}$ miles of railway, viz.:—Main line, 14; Littletown branch, $4\frac{1}{4}$; Thornley branch, $\frac{1}{2}$; Wingate branch, $4\frac{1}{2}$ miles; and to take land to the extent of 65 acres for docks, etc., including the inner harbour. The capital which they were authorised to raise in joint stock was £209,000, and by loan £70,000. They were empowered to demand a toll of $\frac{3}{4}$ d. per ton per mile for coal and coke carried along the line—though it was the opinion of the promoters that $\frac{1}{2}$ d. was as much as ought to be charged†—2d. per ton for wharfage and $1\frac{1}{2}$ d. per ton register for dock dues. A few articles of merchandise were scheduled, but there was no provision in the Act for the conveyance of passengers.

With the help of the Railway Company, the Commissioners of the Pier and Port also obtained an Act, empowering them to raise funds for the purpose of improving the outer harbour. As they had practically no security to offer—their revenue in 1832 only amounted to £34 7s. 9d.—it



* Supplement to Reprint of Sharp's *History of Hartlepool*, 1851, p. 15.

† Thomas Wood to Matthew Plummer, 17th June, 1833. Letter Book.

would have been impossible for them to have exercised the powers of their Act, had not the Railway Company come forward to their assistance and advanced a considerable sum of money which enabled them to proceed at once with the restoration of the pier.

The first general meeting of the Dock and Railway Company under their Act was held at Durham on the 18th of June, 1832, when the following directors were elected: Rowland Burdon (chairman), Rowland Burdon, Junr., Robert Barnett, George Blakelock, Percival Forster, William Green, Lord Howden, William Readhead, William Thomas Salvin, Walter Scruton, William Vollum, John Walker, George Hutton Wilkinson, John Wood and Thomas Wood. On the 9th of July, James Milne, of Edinburgh, was appointed engineer for the docks and harbour, and Edward Steel engineer for the railway, with James Wood and John T. W. Bell as assistant engineers. Christopher Tennant acted as superintendent of the works, an appointment confirmed on the 18th of September.

The first thing to be done in connection with the harbour was to exclude the sea, and so the Company proceeded to construct a coffer-dam between the bastion at the entrance of the inner harbour and the Middleton estate, the excavation for the docks being necessarily delayed until the completion of the work. The first contracts for the railway were let in August, 1832, for bridges over the Hesleden Dene, Swan Castle and Edderacres becks, and for cuttings in the Shotton Grange and Edderacres estates: others were let in December for a cutting in the Crimdon House estate and a large embankment in the parish of Hart.

Hardly had the Hartlepool Company begun operations than they were threatened with competition at the northern extremity of their line; the Newcastle Corporation having projected a railway, 16 miles in length, from Durham by way of Pitlington and Penshaw to South Shields, with a branch thrown out at Rainton to tap the Moorsley coal-field. By means of another branch from Hylton Lane to a landing place on Monkwearmouth shore, it was intended to connect the Wear with the Tyne. The survey for this line having been made in October, 1832, by Thomas Sopwith, under the superintendence of John Buddle, the promoters announced their intention of going to Parliament in the ensuing session,* but the bill, of which notice had been given, for some reason or other, was never introduced.

This attempt to divert the coals of a district which, geographically,

* *Durham Advertiser*, 19th October, 1832; *Tyne Mercury*, 13th November, 1832.

belonged to the Wear aroused a spirit of antagonism on the banks of that river. In February, 1833, the Sunderland Dock and Railway Company came forward with the prospectus of a scheme for a dock on the north side of the Wear and a railway to run from the dock to the north of Monkwearmouth, across the river from the Sheepfold Rock to the high ground between the Lambton and Hetton staiths and thence by the most favourable route to the coal-fields south of the Wear, the estimated cost of dock and railway being £150,000. The scheme, however, was not carried beyond this introductory stage.

Mr. Clayton now displayed his great talents as a strategist. He succeeded in getting a company formed to continue the Newcastle and Carlisle Railway to Hebburn. By means of this line, the coals of the Tanfield district could be shipped in deep water. He then promoted, in conjunction with the proprietors of the Stanhope and Tyne Railway, a company to make a short line between the Hartlepool railway at Moorsley and the Stanhope and Tyne Railway, near Washington, which would accomplish the very purposes of the Durham and South Shields Railway scheme. Branches were projected from the Stanhope and Tyne Railway to Monkwearmouth on the one hand, and to the Blaydon, Gateshead and Hebburn Railway near Heworth on the other, with the object of completing the communication between Carlisle, South Shields, Monkwearmouth and Stanhope.

The Hartlepool Dock and Railway Company were taking steps to secure for their port the shipment of coals from the Sherburn House and Gilligate Moor mining districts near Durham. It was evident that if Sunderland could not devise a plan to prevent them, the Moorsley coals would go to South Shields and the Haswell, South Hetton and Gilligate Moor coals to Hartlepool. Sunderland was fully prepared to meet strategy with strategy, and a railway was immediately projected from the head of Gilligate, Durham, through the Sherburn, and near to the Shincliffe coal-field, past the Moorsley and Hetton Pits, to shipping places on the Wear at Sunderland, with a branch to join the Hartlepool Railway at Haswell; such a railway, it was considered, would change the prospects of the Hartlepool Railway at its northern end and of the Durham Junction Railway at its southern end, for, while the Moorsley Pit was 14 miles from Hartlepool and $15\frac{1}{2}$ miles from South Shields, it was not more than $9\frac{1}{2}$ miles from Sunderland, and the owners of Haswell Colliery could save about two miles by going to Sunderland instead of to Hartlepool. In the same newspapers which contained the

parliamentary notices for the Blaydon and Hebburn and Durham Junction lines, as well as for the City of Durham branch of the Hartlepool Railway, the Durham and Sunderland Railway Company announced their intention of applying to Parliament for an Act. A survey was made by Thomas Emerson Forster and John Grace, Junr., for a railway 16 miles and 7 chains in length, viz.: main line 13 miles 6 furlongs 6 chains and branch 2 miles 2 furlongs 1 chain, but, when the plans and estimates were completed, it was too late to take advantage of the ensuing session. It was felt, by allowing a year to go by, that the Company might incur a serious loss to their trade from the competition of rival establishments, and it was therefore proposed to carry the scheme into effect by private negotiations with the landowners, going to the legislature solely for powers to enable the Bishop and Dean and Chapter of Durham to grant leases for ninety-nine years.* A company was definitely formed at a meeting held in Sunderland on the 2nd of May, 1834, when a subscription list was opened and a committee appointed to apply to Parliament for an act of incorporation.† The Haswell Coal Company, who had previously purchased property adjoining Noble's Quay for the terminus of an intended waggonway,‡ agreed to transfer it to the Railway Company as a site for shipping staiths. In bargaining with the landowners, the Railway Company met with difficulties similar to those encountered by the Stanhope and Tyne Company. The most exorbitant demands were made by the owners of small pieces of ground through which the railway would have to pass: in one instance, for about 12 perches of land in Hendon, the Company were obliged to pay a yearly rental of £100 or at the rate of £1,333 per acre. Leaving out of the calculation 6 acres and 23 perches—say a mile of single way—which was burdened with an annual rent of £1,046, the terms varied from £14 to £51 per acre,§ the average rate being £24.

While one party was planning the defence of the Wear by means of a railway, another party was engaged in effecting the same object by means of a dock. A private company had just been formed with a capital of £120,000 for the purpose of constructing, under a royal charter of incorporation, a dock on the north side of the river, and tenders for the works had been invited. In Parliament, during the session of 1834, there was a

* T. Davison, *Minutes of Evidence on Church Leases*, 1838, p. 259.

† *Tyne Mercury*, 6th May, 1834.

‡ Day, *Observations on the Durham and Sunderland Railway*, 1836, p. 82.

§ *Herapath's Railway Magazine*, 1840, p. 769.

clash of rival interests, but the various measures all passed into law, the royal assent being given, on the 22nd of May, to the Blaydon, Gateshead and Hebburn Railway Bill; on the 16th of June, to the Durham Junction Railway and Hartlepool Dock and Railway Bills: and on the 13th of August, to the Durham and Sunderland Railway Bill.

By the first Act authority was given to construct $10\frac{1}{2}$ miles of railway, viz.:—From the Lead Refinery, Blaydon, to Hebburn Quay; from the mouth of the Derwent to the Long Ridge, Swalwell; from the west end of Redheugh Quay to the Gateshead and Hexham road near Emery Crook;* from Askew's plantation, Low Team, to the Team Iron Works;* and from the main line to four different points in Gateshead: to raise capital to the amount of £80,000—£60,000 in shares and £20,000 by loan—and to take tolls similar to those sanctioned in the Newcastle and Carlisle Railway Act.

By the second Act the Durham Junction Railway Company were empowered to make 7 miles of railway and raise a capital of £80,000 in shares and £34,000 by loan. Among the tolls sanctioned, 1d. per ton per mile might be taken for coals and coke conveyed on the railway: an additional charge—the toll for one mile which, of course, varied with the article carried—was allowed to be made for all goods and minerals crossing the bridge over the Wear. Power was given to take pontage in case this bridge should have a roadway for the passage of horses, carriages, cattle and foot-passengers. The Company might provide and charge for locomotive engines, but it is evident, from an agreement dated the 17th of May, 1834, that the line was intended to be worked by the locomotive engines of the Stanhope and Tyne Railway Company.

The Hartlepool Dock and Railway Company were not only empowered by their Act to extend their railway to Durham, but to employ stationary instead of locomotive engines on a part of their main line: they were authorised to charge dues for the use of the drops or spouts at the docks, having no power to do so in their first Act. The fourth Act, which incorporated the subscribers to the Durham and Sunderland scheme and defined their constitution, empowered them to raise a capital of £102,000 in joint stock.

At the first general meeting of the Blaydon, Gateshead and Hebburn Railway Company held on the 9th of July, 1834, the following directors were elected: the Rev. Ralph Henry Brandling, John Brandling, John Dixon, George Thomas Dunn, Cuthbert Ellison, John Forster, Joseph Hawks,

* Not to be made without the consent of Lord Ravensworth.

George Johnson, Joseph Lamb, Matthew Plummer, Benjamin Thompson, Nicholas Wood and William Woods. On the 22nd, John Brandling was elected chairman and G. T. Dunn deputy-chairman. John Blackmore was appointed engineer.

A proposal had been made by the Company, on the 2nd of July, to the owners of Tanfield Lea Colliery for the leading of their coals: the Railway Company to have the use of Tanfield Lea waggonway from its junction with the South Moor Colliery line to the Pit, paying the way-leaves, etc., and leading the coals from the Bute Pit to Hebburn Quay for 5s. 9d. per chaldron.* An agreement was subsequently drawn up on these lines binding the Company to relay the old Tanfield and Tanfield Lea waggonways, thus making a new branch about 6 miles in length, before the 31st of December, 1836. The extension of the railway to Jarrow Grange shore was also under consideration in July, and on the 22nd of August Robert William Brandling came before the directors with a plan for a railway from the Blaydon and Hebburn line near Heworth to South Shields and Monkwearmouth—the South Shields Junction Railway. Mr. Marreco, on the part of the Stanhope and Tyne Railway Company, submitted a similar plan, but required as a *sine quâ non* that the line of the Blaydon and Hebburn Railway from the Ouston Colliery waggonway downward should be abandoned. The directors saw no reason to relinquish any part of their Parliamentary line and, on the 5th of September, gave instructions to their managing committee to proceed with the plans of shipping places at Jarrow, and to keep in view the possibility of the railway being ultimately carried across Jarrow Slake to South Shields.† Their intention to begin the works was shown by an advertisement, dated the 12th of September, 1834, in which tenders were invited for the making of a tunnel under Gateshead, between 400 and 500 yards in length.‡ Some of the shareholders objected to this mode of traversing Gateshead and at a meeting held on the 27th of October, they brought forward another plan, according to which the railway was to be carried on the south side of Pipewellgate and Hillgate with a short tunnel under Bridge Street only.§

So dependent was the Blaydon and Hebburn Railway upon other projects—some of them still in the air—that the directors were unable to proceed at once with the execution of the line.

* *Report on the Affairs of the Brandling Junction Railway, 1843.* Appendix.

† Minute Book, Blaydon, Gateshead and Hebburn Railway.

‡ *Tyne Mercury*, 16th September, 1834.

§ *Ibid.*, 28th October, 1834.

The Durham Junction Railway Company held their first meeting after the passing of their Act at South Shields on the 8th of July, 1834, and elected a board of directors: this consisted of Edward Blount, William Clark, John Clayton, John Fairweather Harrison, William Harrison, Antonio Joaquim Freire Marreco and William Woods. William Clark was chosen chairman by the Board and John Fairweather Harrison deputy-chairman. Thomas Elliot Harrison was appointed engineer.*

Negotiations were opened with the Marquis of Londonderry for the purchase of certain of his waggonways extending from the Broomside, Pittington, Buddle, Alexandrina and Adventure Pits to the Seaham Railway at Rainton Bridge, and from the crossing at Rainton Meadows to the junction with the North Hetton Railway. Two of these the Company proposed to take up—the waggonway from the Alexandrina Pit because it ran parallel with the main line of railway, and the waggonway from Rainton Meadows to Chilton Moor; the remaining ones it was proposed to work, the Marquis and all other parties interested in the collieries guaranteeing for a certain period that the coals worked from the pits specified should be sent down these waggonways at least as far as Rainton Meadows and, in the case of the Rainton and Pittington coals, down the Durham Junction line to the Stanhope and Tyne Railway, but this arrangement was not carried into effect.†

The chief subject that came up for consideration at the early meetings was the form of the bridge by which the railway was to be taken across the Wear. The first idea seems to have been for an iron bridge carrying, besides the railway, a roadway for carriages and foot-passengers. The plan of an iron bridge of 170 feet span was prepared by the engineer and John Green, architect, of Newcastle, but ultimately rejected in favour of a bridge of stone designed by James Walker, C.E. Tenders for the cuttings and embankments on the line of the railway, which were advertised for in October, stood over for two or three months, and it was not until the last week in January, 1835, that the first sod was turned.‡

When the Durham and Sunderland Railway Company obtained their Act, £18,000 remained to be subscribed before the powers of the Act could be put into force, and it was not until meetings had been held in Sunderland and Durham, and appeals made through the local press, that the capital wanted was raised.

* Minute Book, Durham Junction Railway.

† *Ibid*,

‡ *Tyne Mercury*, 27th January, 1835,

The first board of directors—elected on the 29th of September and 9th of October, 1834—consisted of Edward Backhouse, William Bell, Christopher Bramwell, Robert Fenwick, William Gales, John Hubbard, Philip Laing, Thomas Pemberton, Thomas Reed, Junr., John Scott, Robert Scurfield, Henry Tanner, Andrew White, Caleb Wilson and Thomas Wood. Thomas Pemberton was the first chairman. At the second “court of directors,” as the meeting was called, held on the 15th of October, Thomas Emerson Forster, was appointed the engineer and instructed to report on the comparative merits of locomotive and fixed engines as applicable to the Durham and Sunderland Railway: on his recommendation the directors decided to adopt stationary engines and work the whole of their traffic by this power. It was found desirable to alter the course of the line near Sunderland, taking it to the staiths by way of Barrack Street, instead of along Ropery Lane as originally intended. A suggestion was made to the directors that they should purchase the Hetton Railway and staiths and abandon a portion of their own line. The Hetton Coal Company were anxious to dispose of their railway and angled for a definite offer, hinting at the possibility of another party (unconnected with the Durham and Sunderland Railway) coming forward to treat with them for the acquisition of their line and the leading of their coals: but, after some futile negotiations, the Railway Company resolved, on the 28th of November, to proceed with the formation of their own line.* The works of the railway were partially commenced on the 24th of December, 1834, but were not generally prosecuted until the month of February, 1835.

The development of Sunderland and Hartlepool as coal-shipping ports caused alarm on the banks of the Tees as well as on the banks of the Tyne, and there were good grounds for it. The port charges at Middlesbrough in 1833, on a vessel of 219 tons register, carrying 300 tons of coal, were £13 7s. 5d., at Sunderland they were £10 16s. 9½d., and at Hartlepool only £6 16s. 8d.† While Hartlepool, therefore, was contending with the difficulties incidental to its works of improvement, a rival harbour was projected on the south side of Tees Bay, at Redcar, by W. A. Brooks, the resident engineer to the Tees Navigation Company. This port it was proposed to connect with Middlesbrough by means of a ship canal. Meetings were held

* Minute Book, Durham and Sunderland Railway, 15th October to 26th November, 1834. Day, *Observations on the Durham and Sunderland Railway*, 1836, p. 81.

† Thomas Wood, *Minutes of Evidence on the South Durham Railway Bill*, 1836, p. 8.

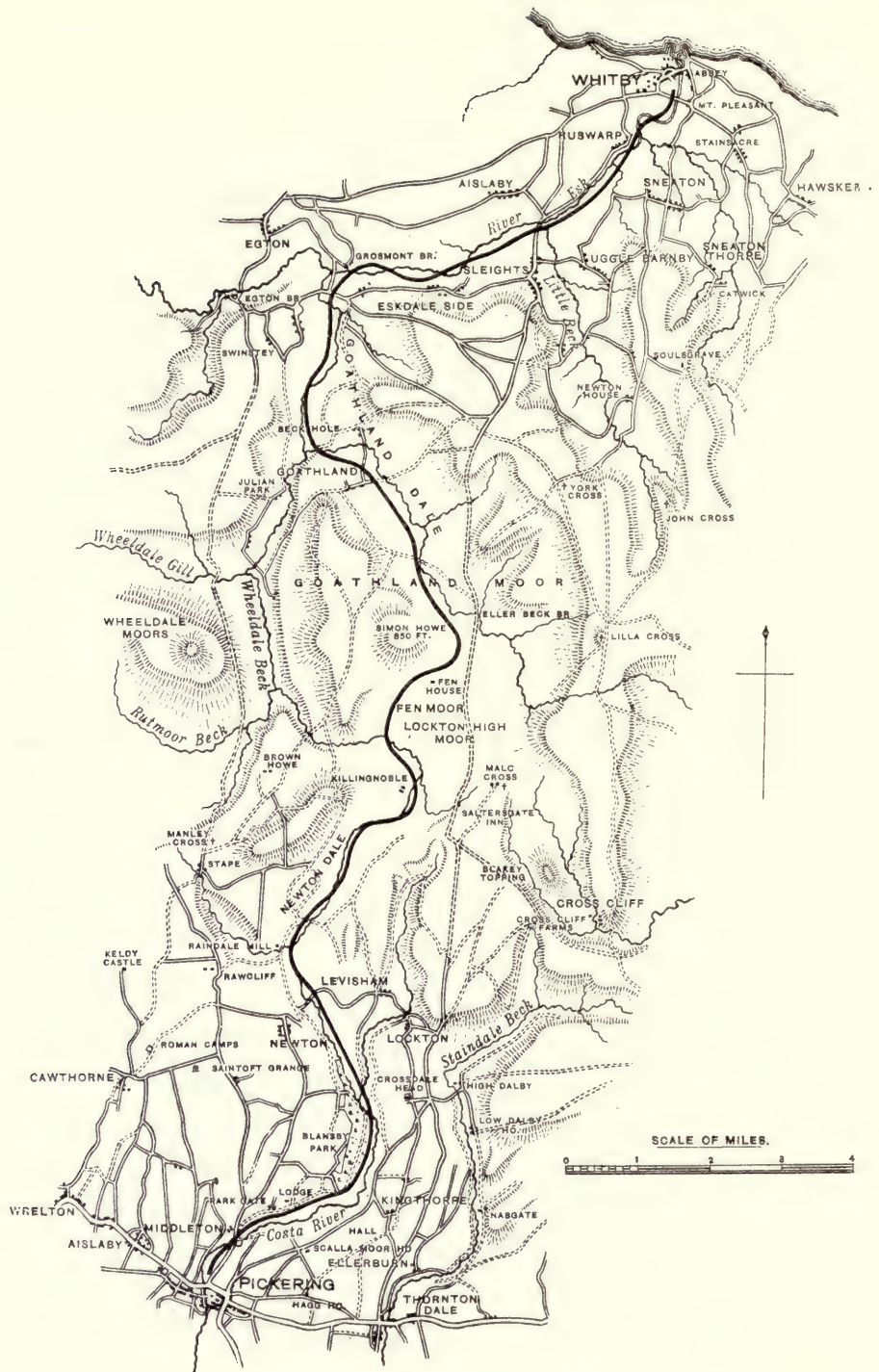
in London on the 1st of June, 1833, and the 19th of March, 1834, in support of the scheme and a subscription list was opened at Redcar on the 29th of October, 1834. William (afterwards Sir William) Cubitt reported favourably on the scheme in December, and a bill was introduced into Parliament, but as one of its clauses proposed the levying of a tonnage rate on all loaded ships or vessels navigating the North Sea which should pass the new port or harbour, it was strongly opposed and eventually thrown out in committee.*

Further south, on the Yorkshire coast, unaffected by this spirit of competition, the old seaport town of Whitby was also taking part in the railway movement. As early as 1826 the idea of a railway to Pickering had been broached, and its utility shown, in the pages of the *Whitby Repository*.† In December, 1830, and February, 1831, another writer adverted to this subject in the pages of the same magazine. The necessity of having a better communication with the interior of the county than the rough moorland roads was gradually brought home to the people of Whitby, but it was a question for a time, whether the railway should go to Pickering or diverge from Grosmont, up the valley of the Esk, and sweep round to the Stockton and Darlington Railway; the object of forming this connection being to render Whitby available as a port for the shipment of the Durham coal. The prime mover in the scheme was Robert Campion, of Whitby. At his request, Thomas Storey, the engineer of the Stockton and Darlington Railway, went over the ground and reported in favour of the line to Stockton, suggesting that, after leaving the valley of the Esk, it should proceed by way of Kildale, Easby and Tanton Hall, near Stokesley, and form a junction with the Darlington Railway either at the south-east end of the suspension bridge or at the point where that railway crosses the road from Yarm to Stockton, a total length of $39\frac{1}{2}$ miles.

This report was read at a public gathering in Whitby on the 2nd of March, 1832, and at a meeting held on the 6th of May it was decided to have a survey made for the line pointed out and for a branch to Pickering. The first estimate of the cost of the railway was £120,000, and, on this estimate, the subscribers to the survey were prepared to go forward with their scheme: but, on revising his calculations, the engineer found that the railway could not be constructed for less than £226,000! On the 31st of October it was decided to have Mr. Storey's line examined by another engineer. Eventually, George Stephenson was consulted. His report, dated the 5th

* *Durham Advertiser*, 17th July, 1835.

† Vol. ii., p. 280.



PLAN OF WHITBY AND PICKERING RAILWAY.

of July, 1832,* was adverse to the Whitby and Stockton scheme. From a consideration of the gradients of the line—the rise to the summit level at Kildale being 602 feet—he calculated that the length of the lead from Whitby to the Stockton and Darlington Railway would be equal to a distance of 57 miles of level line, and he then showed how little prospect there was of such a line competing with the existing mode of communication—by rail to Middlesbrough and by water from Middlesbrough to Whitby. Assuming that Whitby, as a shipping place, possessed advantages over Middlesbrough, would these, he asked, compensate for the extra cost of carriage?

His opinion was more favourable to the Whitby and Pickering scheme. The line, he thought, might be made for £2,000 per mile, exclusive of the cost of land. In estimating the probable revenue he set down £13,200 for the carriage of coal and lime alone. A considerable quantity of whinstone, freestone, timber and agricultural produce would also, he anticipated, pass along the line.

In September a company was formed to carry out Stephenson's plan. Before the end of the month nearly half the capital was subscribed. A dividend of 10 per cent. seemed certain if a revised estimate of the gross receipts, viz., £12,958, should prove to be correct. A more detailed statement, however, of the probable revenue was called for, founded on local knowledge: this was furnished by William Thompson, of Whitby, in a pamphlet published in 1833.† The gross receipts he estimated at £8,787 10s. 0d. (coals, lime and limestone, £5,537 10s. 0d.; timber, whinstone, flagstone and freestone, £3,250) and the net receipts at £6,000 which, on a capital of £80,000, would yield a dividend of $7\frac{1}{2}$ per cent. Happily unopposed, the Company went to Parliament. An Act was obtained on the 6th of May, 1833, at the comparatively small cost of £2,867 19s. 5½d.‡ The course of the line sanctioned was from a shipbuilding and timber yard on the western bank of the Esk in the township of Ruswarp—a little to the south of the present passenger station at Whitby—up the vale of the Esk as far as Grosmont, thence up the vale of Goathland to Fen Steps and down Newton Dale to Pickering, the terminus being at the north-east side of Bakehouse Lane—a total length of 24 miles.

Power was given in the Act to alter the course of the river Esk at Larpool Flat by means of a cut. The capital authorised was £105,000,

* Reprinted in *Whitby Repository*, 1832, p. 235.

† *The Whitby and Pickering Railway: its Probable Traffic and Revenue*, by William Thompson, 1833.

‡ *Yorkshire Gazette*, 19th October, 1833.

£80,000 to be raised in shares and £25,000 by loan. The tolls which the Company might take varied from 2d. to 6d. per ton per mile, those for coal, lime and building stone, from which the bulk of the revenue was expected, being 3d. A shilling per ton extra might be charged in respect of goods passing up, but not down, the Goathland inclined plane. The railway was intended to be used for passenger traffic, and the Company might demand a toll of 2d. for every person conveyed in carriages upon the line. The Company were empowered to provide and charge for locomotive power.* The following directors were appointed by the Act: Joseph Barker, Barker William Barker, John Barry, Robert Barry, Charles Belcher, William Benson, Robert Campion, John Campion, Aaron, Abel, Edward, John and William Chapman, George Cholmley, Thomas Fishburn, John Frankland, Nicholas King, John Langborne, Richard Moorsom, Richard Ripley, Henry Simpson, Thomas Simpson, Gideon Smales, the Rev. William Henry Smith, John Wilson and James Wilkinson. At the first meeting of the directors held on the 30th of May, 1833, Robert Campion was appointed chairman and Thomas Fishburn deputy-chairman. Steps were immediately taken to obtain the consent of the Admiralty to the diversion of the river and the erection of the necessary embankments or walls for the support of the railway along the west side of the river and, in the latter part of June, George Stephenson made a minute survey of the line preparatory to its being finally laid out. He altered the direction of the inclined plane at Goathland in order to give it an easier slope and, by an ingenious arrangement, made it self-acting, thus obviating the necessity for a fixed engine at the top. In the latter part of August the contract was let for forming 3 miles of railway at the Whitby end, from the Stone Quay at Boggall to Sleights Bridge, and on the 10th of September the works were begun under the superintendence of John Harding, the resident engineer. Other contracts were soon afterwards let for $6\frac{3}{4}$ miles at the Pickering end and for excavating the channel for the river on Larpool Flat, so that when the first general meeting was held on the 17th of October, a good deal of preliminary work had been accomplished. At this time there were only 7 miles of iron road between the Tees and the Humber—the Middlesbrough branch of the Stockton and Darlington Railway, and a short private line which had been opened a few months previously between Kepwick Moor and certain limekilns near Leake Church.

* Another clause declared that it should not be lawful for the Company or for any other corporation or person whatsoever to use or employ locomotive steam-engines upon the railway or upon any part thereof (p. 79).

Though the line to Pickering had been selected in preference to a line to the Tees, some of the supporters of the latter scheme in Stokesley, with Sir William Foulis, Bart., at the head of them, thought that a part of the original plan might be carried out as a separate undertaking. A prospectus was therefore issued in the autumn of 1833 for a railway, 8 miles in length, from the Yarm branch of the Stockton and Darlington Railway to Stokesley, crossing the Tees by a cast-iron bridge near Barwick.* From Whitby the railway movement spread to the other old seaports of the Yorkshire coast, and lines were promoted to connect them with the West Riding of Yorkshire—one from Scarborough to Malton, York and Tadcaster and thence to the Leeds and Selby Railway near Sherburn,† another from Bridlington Quay to the Leeds and Selby Railway at Selby.‡ All these schemes, however, while arousing public interest, received but little public support and ere long melted into thin air.

At the southern extremity of Yorkshire, efforts were being made to complete the original plan for a railway between Leeds and Hull. Another survey was authorised, and, in July, 1834, Messrs. Walker and Burges submitted a plan, section and estimate of a railway from Selby to Hull. They reported that the ground for nearly the whole of the distance was level and that, except in Selby and Hull, not a building would be interfered with. Their estimate for a railway of two lines having sidings at convenient distances and additional land for two other lines if needed, together with a proper equipment of rolling stock, was £340,000.§ Shortly afterwards, by resolution of a public meeting held on the 11th of August, was formed the Hull and Selby Railway Company. Three months later upwards of £100,000 had been subscribed, and it was announced that preparations were being made for obtaining parliamentary sanction to the scheme.|| Looking at these early railways, all of them tending so inevitably to the ports of the north-east coast as if in accordance with a definite plan, one already sees them falling into their places as parts of a great system—a system in process of development.

* *Prospectus of the Stokesley and Tees Railway*, 1833. *Yorkshire Gazette*, 19th October and 2nd November, 1833.

† *Yorkshire Gazette*, 7th and 28th December, 1833. ‡ *Leeds Mercury*, 15th Feb., 1834.

§ *Report to the Subscribers for a Survey of the Part of the Leeds and Hull Junction Railway between Hull and Selby*, by Messrs. Walker and Burges, 28th July, 1834, p. 5.

|| *Tyne Mercury*, 11th November, 1834.

CHAPTER VIII.

FIVE YEARS OF RAILWAY CONSTRUCTION.
(1831-1835.)

During the progress of the struggle for the coal-fields of Durham, as described in the preceding chapter, the Clarence Railway Company had obtained powers to construct two additional lines—the Chilton and Merrington branches, which were intended to be joined by waggonways from Leasingthorne and Ferryhill; to extend their main line to Saltholme Marsh in consequence of the injury done to the shipping places at Samphire Batts by the jetties of the Tees Navigation Company; and to abandon part of their parliamentary line between Shincliffe and Durham.

Presented in tabular form, the results of these various applications to Parliament and private arrangements for way-leave, up to August, 1834, reveal an extraordinary amount of enterprise.

NAME OF RAILWAY.	A C T.		Length of Line. Miles.	Capital intended to be raised in Shares or by Loan.
	Description.	Date of Royal Assent.		
Stockton and Darlington Railway...	2 Geo. IV., c. 44	19 April, 1821	42	£ 244,300
	4 „ „ c. 33	23 May, 1823		
	5 „ „ c. 48	17 May, 1824		
	9 „ „ c. 60	23 May, 1828		
Clarence Railway	9 „ „ c. 61	23 May, 1828	47 $\frac{3}{4}$	440,000
	10 „ „ c. 106	1 June, 1829		
	2 Wm. IV., c. 25	3 April, 1832		
	3 „ „ c. 4	29 Mar., 1833		
Newcastle-upon-Tyne and Carlisle Railway	3 „ „ c. 95	18 June, 1833	63	500,000
	10 Geo. IV., c. 72	22 May, 1829		
	2 Wm. IV., c. 92	23 June, 1832		
Leeds and Selby Railway	11 Geo. IV., c. 59	29 May, 1830	20	300,000
Stanhope and Tyne Railway			37 $\frac{3}{4}$	200,000
Hartlepool Dock and Railway ...	2 & 3 Wm. IV., c. 67	1 June, 1832	28 $\frac{1}{2}$	339,000
	4 & 5 Wm. IV., c. 56	16 June, 1834		
	3 Wm. IV., c. 35	6 May, 1833		
Whitby and Pickering Railway ...			24	105,000
Blaydon, Gateshead, and Hebburn Railway	4 „ „ c. 26	22 May, 1834	16 $\frac{1}{2}$	80,000
	4 „ „ c. 57	16 June, 1834	7	114,000
Durham Junction Railway				
Durham and Sunderland Railway	4 & 5 Wm. IV., c. 96	13 Aug., 1834	16	102,000
			302 $\frac{1}{4}$	£2,424,300

Looking at the above statement, the most obvious fact that strikes us is the extent to which the North of England was concerned in the railway movement of this period.

The total length of line shown is practically the same as that of the London and Birmingham, the London and Southampton, the Grand Junction, and the Liverpool and Manchester Railways*—the principal railways sanctioned by the legislature up to that time; in other words, no more ground would have been covered in travelling from Southampton to Manchester and from Newton Junction to Liverpool than in going over the lines of the ten railway companies whose progress we have now to follow.

The North of England was invaded by an army of “ navigators,” raising huge embankments and cutting through rocks and ridges. From the Eden to the Tyne and from the Tyne to the Humber, the railway engineer was at work, directing operations which were changing the face of the country. He was to be met with on the Stockton and Darlington Railway no less than on the new lines. Immediately after the opening of the Middlesbrough branch, it had been decided to proceed with the doubling of the main line between Brusselton Bank Foot and Stockton, a distance of $19\frac{3}{4}$ miles,† which meant the widening of most of the cuttings and the laying down of 987 tons of malleable iron rails, 285 tons of cast-iron chairs and 70,000 stone blocks for sleepers.

The difficulty of dealing with a sudden expansion of traffic on a single line of railway was exemplified a few months afterwards, during the great strike among the pitmen of the Tyne and Wear, which advanced the Tees coal fully twenty years in the London market.‡ Besides doubling the line—which was effected in 1831-2—the Company erected, during the same period, extensive workshops at New Shildon for the building, as well as the repairing, of locomotive engines. A good deal of work was also done to the bridges over the Skerne and the Tees, the former being strengthened with additional masonry, and the platform of the latter supported by means of trussing. Further facilities for the shipment of coals were also provided

	Miles.
* London and Birmingham Railway	112·25
London and Southampton Railway	76·55
Grand Junction Railway	82·63
Liverpool and Manchester Railway	30·66
	<hr/>
	302·09
	<hr/>

† Sub-committee minutes, 14th January, 1831.

‡ *Larchfield Diary*, p. 25.

at Middlesbrough in the shape of a second lifting engine and two more staiths. The line, in view of the threatened competition, might be described as not merely in good working, but in good fighting order.

Meanwhile, the Clarence Railway was being constructed with all possible speed, the main line from Samphire Batts to Simpasture, the Durham branch as far as Thrislington, the Sherburn branch as far as Quarrington and the Stockton branch to its Parliamentary termination. The earthworks were generally heavy. The Norton Toll Gate cutting (Russell's Cut), about five miles west of Port Clarence, contained 400,000 cubic yards; the Whitton cutting, three miles further west, 220,000 cubic yards; the greatest depth of the one being 60 feet and of the other 42 feet. At Rudd's Hill, near the present Ferryhill Station, the railway was cut through the solid rock to a depth of 67 feet, exposing an interesting section of the three lower divisions of the Permian system. Nearly 100,000 cubic yards of rock were removed from this excavation, the breadth of which, at the top, was 75 yards and, at the formation level, 25 yards.* The principal embankments were at this time, and for some years afterwards, among the highest in the country, the Whitton or Bishopton Beck embankment being 75 feet high, the Stillington Moorhouse embankment 60 feet,† and the Billingham Beck embankment 50 feet. Unfortunately for the Company, they were improperly constructed, and it was not without much additional expense that they were afterwards made up to the requisite section. Great difficulty was experienced in carrying the railway over Nunstainton and Mainsforth Carrs—the embankment was formed on a peat-bog and kept continually sinking.

Though the line, in certain places, was only laid in a temporary manner, the Company decided, from financial considerations, to bring it immediately into operation. They had borrowed £100,000 from the Exchequer Loan Commissioners at 5 per cent., and, in order to pay the interest on this sum, it was expedient that the railway should be earning some revenue. The first coals delivered on the Stockton branch went down the main line in August, 1833,‡ setting up a competition which, in less than a year, reduced the traffic to the bridge-end depôts from 26,762 tons to 9,482 tons. This “interference of a rival company with their landsale department” touched the Stockton and Darlington Board to the

* Day's *Formation of Railways*, 1839, p. 36.

† *Ibid.*

‡ Richmond's *Local Records of Stockton*, p. 167.

quick. They could not, of course, prevent traffic for the Clarence Railway from passing along their line, but they could throw obstacles in its way. On the 6th of September, they exhibited a notice at the Thickley Weigh House, prohibiting the Clarence horse-leaders from travelling on the railway one hour after sunset or one hour before sunrise, though their own horse-leaders might do so.* Coal waggons going down the Stockton and Darlington Railway, on arriving at Thickley, were merely charged *by the tale*, that is, they were counted as they went past; those going by the Clarence Railway were stopped and weighed separately.† When the Clarence Railway Company began carrying coals for exportation, shipping the first coals at Stockton on the 29th of October, 1833,‡ the Stockton and Darlington Board made their master-move. Upon all coals delivered at Simpasture, as at other intermediate points on their line, they charged landsale dues. Now let us see how this plan worked. In December, 1833, some coals from Butterknowle Colliery were sent down the Clarence Railway for exportation. They travelled 10 miles on the Stockton and Darlington Railway and were charged at the rate of 2½d. per ton per mile, which included—somewhat unfairly, it must be added—a farthing for depôt rent and agency. The cost of transport to Stockton was therefore increased by at least 3½d. per ton if the coals went to the Clarence, instead of to the Stockton and Darlington, staiths. In other words, the owner of the colliery had to pay 3s. 2½d. instead of 2s. 11d., when the Stockton and Darlington Company charged the full dues; but, as the dues at this time upon coals for exportation were subject to a considerable reduction—a drawback of 50 per cent. had been allowed between July and November—the contrast between the two charges was very much more striking. This was a lesson, as the agent of the colliery explained to a committee of the House of Commons, not to send any more coals down the Clarence Railway.§ The relations between the two companies were not improved by another futile attempt on the part of the Clarence Railway Company to enter the Auckland coal-field by opening a tunnel through the Eldon estate—a favourite scheme of Mr. Christopher Tennant's. The intention of the Company, as embodied in their application to Parliament, was to abandon

* *Minutes of Evidence on the Durham South West Junction Railway Bill*, 1836, p. 88.

† R. Blanshard, speaking at Wolsingham, 27th September, 1836. *Durham Advertiser*, 30th September, 1836.

‡ *Richmond's Local Records of Stockton*, p. 167.

§ *Minutes of Evidence on the Durham South West Junction Railway Bill*, 1836, pp. 45, 46.



T. H. Hair, del. et sc.

PORT CLARENCE DROPS.

their Deanery branch and make other lines to Etherley and St. Helens Auckland.*

By the beginning of 1834, the northern line of the Clarence Railway to Quarrington was sufficiently advanced to admit of the passage of traffic, and the first cargo of Crowtrees Wallsend coals was shipped at Stockton on the 16th of January.† On the 30th, a small staith which had been erected at Haverton Hill was brought into use.‡ A few months afterwards, though the great river embankment was far from complete, the line was thrown open to the deep water shipping-place at Samphire Batts, subsequently known as Port Clarence, where at this time there was but one staith. The form of drop which the Company had adopted at the suggestion of Mr. George Leather, of Leeds, differed from that of the Middlesbrough drops, the waggons being lowered perpendicularly instead of curvilinearly to the deck of the vessel.

By the spring of 1834 about 28 miles of single way had been brought into operation. The gradients, for a purely mineral line, were most favourable; the average rate of inclination from Simpasture to Port Clarence being 1 in 270, from Quarrington to Stillington Moorhouse 1 in 450 and from Norton Junction to Stockton 1 in 209.§ The permanent way differed from that of the other lines of the period by being laid with parallel, instead of fish-bellied, rails. These were of malleable iron, scarf-jointed or half-lapped, weighing 32 lbs. to the yard.|| The chairs, into which they were fixed by cast-iron keys, were seated on stone and wood blocks.

But the traffic, so ardently wished for, was slow in coming. The receipts barely paid the expenses of maintenance. During the first year they only amounted to £2,206 6s. 2d. The Company found themselves in financial difficulties from which they were never able to extricate themselves. On the 31st of July, 1834, they decided to ask the Exchequer Loan Commissioners to take control of their affairs. The seat of administration, at the desire of the Commissioners, was then removed to London—the cause of much subsequent mismanagement—and a new board of directors undertook the responsibility of carrying on the concern. Edward Steel, the first engineer, had been superseded in October, 1833, by Thomas King, who was

* *Durham Advertiser*, 22nd November, 1833.

† *Ibid.*, 17th January, 1834.

‡ *Durham Advertiser*, 14th February, 1834.

§ *Whishaw's Railways of Great Britain*, 1842, p. 59.

|| *Day's Formation of Railways*, 1839, p. 160.

replaced in November, 1834, at the recommendation of the Commissioners, by Thomas Rhodes, and to him fell the task of completing the works. The raising and enlarging of the embankments, especially of those from Haverton Hill to Port Clarence and at Ricknall Mill, the replacement of temporary wooden by permanent bridges and the doubling of the line, which it was proposed to adapt to the use of locomotive engines, made further inroads on their capital, and the Company resolved to create 1,000 additional shares.* These, however, owing to their embarrassed circumstances, they were obliged to issue at a discount of 65 per cent., thus saddling the concern with £100 of liability for every £35 received.

When the Clarence Railway was within a few months of being opened for traffic, another railway—the Stanhope and Tyne—which had an equally unfortunate career, was being carried expeditiously across the undulating surface of north-west Durham towards Kyo. From this point eastward to the Durham turnpike road, near Pelaw Grange, an alteration of plan had become necessary. Intending to adopt as part of their line the Beamish Colliery Railway† (which had not long before been relaid with iron rails in substitution for wooden ones), and to reach it by following the course of the old Shield Row waggonway, the Company had made an agreement with Major Swinburne for a right-of-way through his lands of Kyo and Pea, and opened negotiations with Mr. Morton John Davison for the purchase of his railway, but failing to come to terms with him, they were obliged to fall back upon a line running by way of West Stanley to Stella Gill and thence to the Durham road, along what was practically the course of the first waggonway constructed in the Wear district—the waggonway from Pelton Fell or Flatts Colliery. Early in May, 1833, the Company were ready to proceed with the formation of the lower part of the line. Some obstacles were thrown in their way by the copyholders of Pelton Common, but on the 17th of May the tenders were let, and the works began very soon afterwards. The South Shields Improvement Commissioners having objected to the railway passing through the town, as at first intended, on the street level, the Company were obliged to erect bridges, not less than 15 feet in height above the roadway, over King Street, Queen Street, etc., and these were completed in November, 1833.

The site of a shipping-place, the selection of which was a matter of the first importance to a railway like the Stanhope and Tyne, had been fixed at

* Minutes of Special General Meeting, 1st October, 1834.

† William Harrison to Thomas E. Harrison, (?) August, 1832.

the lower end of South Shields, at the foot of Fairless's and Harding's ballast hills in front of the Long Row and Wapping Street. This site would naturally suggest itself to William Harrison, who, sixteen years before, had been associated with Benjamin Thompson in obtaining a lease of Fairless's quays for the use of the owners of Fawdon Colliery, then about to ship coals from keels at South Shields.* The young engineer of the railway had already conceived the idea of a coal-shipping dock on the Tyne, and the Company, having purchased the three small docks known as Laing's dock and Fairless's docks for the purpose of making them into one large wet dock, obtained a license on the 24th of December, 1833, from the Corporation of Newcastle to build a quay wall, two or more feet above the highest spring tides, along the whole front of these premises and to erect gears, etc., upon it.

On the 1st of May, 1834, the first locomotive engine (built by R. Stephenson & Company) was placed on the line at South Shields.† On the 15th, the upper part of the line, extending from Stanhope to Annfield, a distance of $15\frac{1}{4}$ miles, was opened for traffic, the first four waggons of lime being despatched from the Company's kilns at one o'clock. The day's proceedings were marred by a melancholy accident. Four waggons, crammed with workmen and others, were started from the Weatherhill engine before the clutch had been released from the drum. There was a sudden jerk at the rope and a shackle snapped. The waggons ran amain down the incline, gathering speed as they went, and would have rushed down the next incline had not a young man connected with the railway switched the runaway set into a siding where four loaded waggons were standing. In the collision which ensued several persons were injured, two men and a boy fatally.‡

Between Stanhope and Annfield the line was worked by three different kinds of power, viz., fourteen and a half miles, in about equal proportions, by stationary engines and horses, and three quarters of a mile by gravity. The rails used on the line were of fish-bellied form, weighing 30 lbs. and 40 lbs. to the yard, supported on stone blocks, some of which measured $20 \times 16 \times 11$ inches and others $18 \times 14 \times 10$ inches.§ The gauge of the line was 4 feet 8 inches.

* Benjamin Thompson's Diary, 2nd January, 1818.

† *Durham Chronicle*, 9th May, 1834.

‡ *Durham Advertiser*, 23rd May, 1834.

§ Shaw & Proud's tender, 2nd July, 1833. No two of the blocks were exactly alike in size. They merely approximated to a standard. One, in Hownes Gill, measures $19\frac{1}{2} \times 15 \times 13$ inches; another in Waskerley Park, near Parkhead, $17 \times 16 \times 9\frac{1}{2}$ inches.



HOG HILL TUNNEL FROM THE SOUTH.

The terminus was half a mile north of Stanhope, near the Lanehead Farmhouse. Here were the lime kilns and coal depôts built by Whitfield Gardner, whose name is preserved on a sun dial. From the kilns, 796 feet above the sea-level, the waggons were drawn up an inclined plane half a mile in length, with gradients of 1 in 12 and 1 in 8, passing through a short tunnel which still bears, on a panel above its southern entrance, the date 1833. At the Crawley engine (1,123 feet) the rope was thrown off and, another rope being attached to the waggons, they were drawn for over a mile up the Weatherhill engine plane, the gradients of which were 1 in 21 and 1 in 13, to the summit level at Whiteleahead, 1,445 feet above the sea. From this elevated railway outpost, the highest point, be it noted, on the North-Eastern system and, indeed, with one exception—the Dalnaspidal summit of the Highland Railway—the highest point on any railway system in the United Kingdom, a succession of bleak fells, all shaggy with heather and bracken, rolled monotonously away to the horizon, little changed in aspect since the day when an adventurous cohort of the Gordian legion first penetrated into Weardale. On the one hand, the view was bounded by Collier Law, rising to a height of 1,692 feet, and on the other by Bolt's Law, overtopping it by 80 feet. Near Whiteleahead was situated the first lime depôt out of Stanhope, for the accommodation of the inhabitants of Blanchland, Edmundbyers and Hunstanworth.

Horses worked the next section, about a mile and a half in length, across the wild tract of Waskerley Park, an ancient enclosure of the priors of Durham, the railway, unfenced from the surrounding moorland, descending for over half a mile at the rate of 1 in 2,059, and for a mile at the rate of 1 in 80 and 1 in 88. At the Park Head wheel-house, the waggons were attached to what is called a tail-rope and let down an incline, a mile and a half in length, to a stationary engine at Meeting Slacks, when, the rope being changed, they continued their descent down a second incline a mile and a quarter in length; the steepest gradients of the one were 1 in 80 and 1 in 82, and of the other 1 in 35, 1 in 41 and 1 in 47. They next came to a self-acting incline, three quarters of a mile in length, with a gradient of 1 in 14. This was Nanny Mayor's Bank, called after Mrs. Mayor, the tenant of the Tween House Farm, over which the old railway passed, and the landlady of a moorland tavern on the west side of the incline.* From the foot

* One of the earliest specimens of Lough the sculptor's work is a carving on a headstone in Muggleswick churchyard, erected to the memory of some members of Mrs. Mayor's family.

the waggon was slewed round to its ordinary position and worked forward to a turntable at another corner, which placed it once more at right angles to the line. It was then run on to another truck and raised to the top of the Gill, where, after being turned round a fourth angle, it was able to proceed in a more direct fashion. The average number of waggons which could be taken across Hownes Gill in an hour was twelve. Both inclines were worked at once, so that the weight of the descending waggon might assist the engine. The truck appears to have run on two pairs of rails, the width of the outer pair

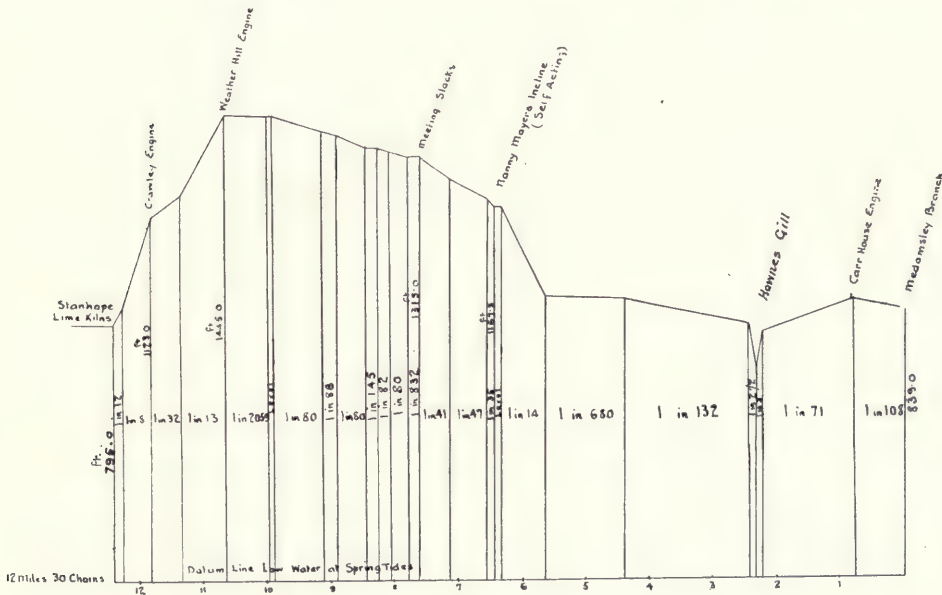


TABLE OF GRADIENTS, STANHOPE AND TYNE RAILWAY.

being 7 feet $0\frac{1}{2}$ inch and of the inner pair 5 feet $1\frac{3}{4}$ inches. Though the fame of Hownes Gill attracted many visitors—Dr. Granville went out of his way to see it in 1839*—none of them appears to have made a sketch of this singular machinery of transport which Mr. James Clephan, the editor of the *Gateshead Observer*, described in 1843 as “one of the most wonderful railway rarities in existence.”† It is somewhat curious that the same device which was used in 1834 in north-west Durham for conveying the waggons in a horizontal position across a ravine should have been adopted in Central Africa in 1901. In the

* *The Spas of England*, 1841, pp. 309-311.

† *Gateshead Observer*, 30th December, 1843.

“carrier” of the Uganda Railway employed on the Kikuyu temporary inclines,* we have, to all intents and purposes, the incline truck of the Stanhope and Tyne Railroad.

From the north-east bank head there was an ascent of 1 in 71 for a mile and a quarter, followed by a descent of 1 in 108 for three quarters of a mile, both planes being worked by an engine at Carr House. Eleven miles from Stanhope was the first colliery on the line, the Consett Pit, to which there was a short branch. Along the elevated ridge above the river Derwent ran the railway through a wild bleak district, in which the only habitations at this time were Delves House, Carr House, Barr House and a few thatched cottages—a district now occupied by the great iron works and town of Consett.

Near the old Roman road, the Watling Street, the railway was joined by the Medomsley branch, a mile and a half in length, leading to one of the Company's own pits. Horses worked the traffic between East Carr House and Bantling Castle, a distance of $2\frac{1}{4}$ miles, then a stationary engine on the top of a ridge, just below Pontop Pike, drew the waggons up the Annfield west inclined plane (662 yards) and let them down the Annfield east inclined plane (1,056 yards), better known as the “Loud Bank,” to a point near the Pontop Collieries, $15\frac{1}{4}$ miles from Stanhope.

The lower portion of the line was opened on the 10th of September, 1834. The first section—over $2\frac{1}{2}$ miles in length—was known as the Stanley Level. Commencing at the foot of the “Loud Bank,” it ran on easy gradients to West Stanley, and was worked by horses. Then followed a series of self-acting inclines: Stanley Bank, 1,276 yards; Twizell Bank, 880 yards; and Eden Hill Bank, 1,122 yards: the gradients of which varied from 1 in 21 to 1 in 41 on the first; from 1 in $17\frac{1}{2}$ to 1 in 25 on the second; and from 1 in 17 to 1 in 71 on the third. Pelton Level, worked by horses, broke the continuity of the rapid descent for 1,331 yards, after which there came a fourth self-acting incline called Walldridge or Howlett Bank, with gradients varying from 1 in $20\frac{1}{2}$ to 1 in $24\frac{1}{2}$ descending to Stella Gill.

From Stella Gill there was a comparatively level section, three quarters of a mile long, succeeded by an inclined plane, descending for a similar distance to the Durham turnpike road; the engine that worked the inclined plane from a point near High Flatts also working the level by a tail-rope.

Between the Durham road and Fatfield Gears, which carried the railway over the Biddick Burn, a distance of nearly two miles, there were

* See illustration. *Proceedings of International Engineering Congress, 1901. Section 1, Railways, p. 8.*

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PLATE IX.



From an engraving in the South Shields Public Library, by permission.

Stanhope and Tyne Drops, South Shields.

W. A. Kidd. del

UNIV. OF
CALIFORNIA

two long inclined planes worked by a double engine stationed near Vigo. The line from this point was comparatively level, there being a fall of only 12 feet in the first five miles and of $69\frac{1}{2}$ feet in the remaining four miles and a quarter. This section was worked by locomotive engines, so that, from Stanhope to South Shields, every form of motive power available at this time was in use on the railway: the following table will show in what proportions:—

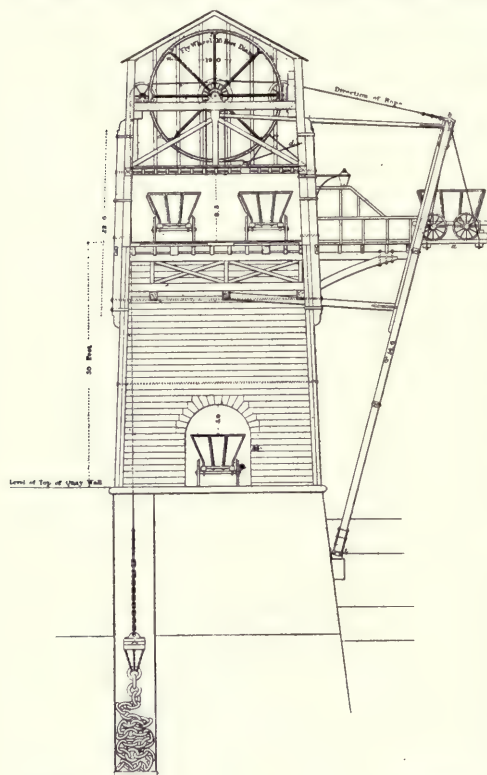
					Miles.	Miles.
Horses—on main line	...	...	...	...	$10\frac{1}{2}$	
on branches	...	...	...	...	4	
						$14\frac{1}{2}$
	No.	Horse-power.				
Stationary engines (9	=	375)	...	...	...	11
Locomotive engines	...	...	...	...	...	$9\frac{1}{2}$
Self-acting inclines...	...	...	...	...	...	3
						$37\frac{3}{4}$

The opening of the first railway to South Shields was fitly celebrated. During the morning of the 10th of September, 1834, a hundred waggons of Medomsley coals were sent down the line for shipment. Some of the directors and others, in a "handsome car" drawn by a small engine, met them at a place called "Fox's Quarry," near the Barnes, and accompanied them to South Shields, a distance of a mile and a half. The waggons were then drawn by horses to the drops and the coals shipped on board the brig "Sally."

These drops, three in number, differed in general construction from the drops previously erected on the Tyne and Wear, and were superior to those at Middlesbrough and Port Clarence. The most noticeable, as they were the most distinctive, parts of the apparatus were the vibrating frame and the counterbalance weight. The former, pivoted at the bottom instead of in the middle, as in the drops at Middlesbrough, was of unusual length— $54\frac{1}{2}$ feet—enabling vessels to receive their cargoes while lying in a depth of water varying from 13 to 16 feet, at low water of a spring tide. The latter, of 5 tons, consisted of a chain of huge cast-iron links, which were raised and lowered, one after the other, in a shaft or well without jerk or jar to the machinery. The whole of the operations were controlled by a brake wheel, 16 feet in diameter. The cost of one of these drops, including all machinery, timber and iron work, but exclusive of masonry and gangway, was about £500: its powers of shipment were from 25 to 35 chaldrons per hour.*

* Diagrams, with a description of these drops, by T. E. Harrison, appeared in the *Transactions of the Institution of Civil Engineers*, vol. ii., 1838.

The Stanhope and Tyne drops were considered worthy of description by Sir George Head, who, in 1835, was much impressed by the spectacle of the waggon upon the cradle, and two men beside it, "descending from a height of upwards of 50 feet down upon the deck of the vessel below and,



T. E. Harrison, del.

J. Lowry, sc.

STANHOPE AND TYNE COAL DROP.

view to the ultimate formation of the dock,† the advantages of which were ably set forth by the engineer in a report to the directors in 1835. The dock—a striking contrast with that which Mr. Harrison was afterwards to design near the mouth of the Tyne—the greatest coal shipping dock in the world—was intended to hold sixteen ships and to have room for eight shipping berths, the estimated cost of it being £24,759. Some of the

with a sweep of a radius of 55 feet, describing its graceful periphery in the air as the stupendous bulk of the counterbalancing chain was dragged upwards, as it were, reluctantly, with a writhing motion," and by the sounds produced during the operations—"the creaking and groaning of timber, the stress on the machinery, the grating of the brake, the rattling of the huge links, the clash of the hammer against iron bolts, and the thundering crash of the coal falling through the bottom of the waggon into the hold of the vessel."* The drops stood on the outer wall of the intended dock, the foundation stone of which had been formally laid by Mr. William Harrison three months before—on the 12th of June.† They were approached by a timber roadway supported by trussed framing which rested on stone piers. All the arrangements for the erecting of the drops had been made with a

* Head's *Home Tour*, vol. i., p. 324.

† *Durham Advertiser*, 20th June, 1834.

‡ T. E. Harrison to J. F. Harrison, 29th January, 1835.

directors—J. F. Harrison and A. J. F. Marreco—did not consider the dock necessary, and it was no doubt owing to their opposition and to the fact of the expenditure of the Company having already exceeded the amount of their capital, that the project was not carried into execution.

Though the line was opened, the Company's collieries were not for some months afterwards in full working order, as shown by the small quantity of the Company's coals which appear to have entered the port of London in 1834.* Only three collieries had arranged to send their coals down the Stanhope and Tyne Railway—the Tanfield Moor, the Washington and the Waldrige—all of which had previously shipped in the Tyne, the first at Dunston, the second at Bill Quay, the third at Poulter's Close. The first coals from Waldrige Colliery—410 tons—were conveyed to South Shields on the 20th November, 1834.† Nine depôts for the sale of lime were erected at various points on the line between Stanhope and South Shields.‡ The Stanhope kilns produced between 50 and 60 chaldrons daily, and as this quantity proved unequal to the demand, additional kilns were erected, in the early part of 1835, near Annfield on Lanchester Common, the Company having the right to burn there all limestone wrought in the Bishop's royalty without any charge.§ The Company had hoped to establish a large export trade in lime with Scotland, but in this expectation they were disappointed.

The Hartlepool Dock and Railway, commenced about the same time as the Stanhope and Tyne Railway, made slower progress. Difficulties arose at the outset in the execution of the works. When excavating for the foundations of the north wall of the West Dock, the workmen found the limestone rock, which dips rapidly from the Town Moor towards the west, so open or "gullety" that the sea-water came freely through. This was a serious obstacle which could only be avoided by a deviation in the course of the walls. The form of the docks was altered, and the area of the Tide Harbour increased from 8 to 20 acres. The change of plan was followed soon afterwards by a change of engineer. Differences of opinion between Mr. Milne and the directors made it impossible for the former to retain his position

* *Report on the Coal Trade*, 1836, Appendix, p. 235.

† *Tyne Mercury*, 25th November, 1834.

‡ A good example of these depôts still remains at the old Boldon Station. It consists of six cells of well constructed masonry, having a panel with the following inscription upon it:—
"Stanhope and Tyne Rail Road Company's Landsale Coal and Lime Depôt, 1834."

§ Wm. Cargill to Jos. Pease, 10th April, 1845. Railway Collection, Newcastle Public Library.

and he was superseded by Mr. James Brown, who had executed the works at the harbour of Holyhead. Mr. Milne, it may be explained, had *insisted* upon building the quay walls entirely of ashlar work, costing about 30s. per cubic yard; the directors, on the other hand, considered that they might be constructed partly of ashlar and partly of rubble work, at a cost of 10s. or 11s. per cubic yard and, in this opinion, they were supported by Sir John Rennie.*

The original intention of the Company had been not to begin shipping coal until the docks and Tide Harbour were alike ready for opening, but after the completion of the coffer-dam (in May, 1833), it was decided to push on with the works of the Tide Harbour and bring it first into operation. The works were carried on, according to Sir George Head, with equal alacrity both day and night without any intermission except on Sundays; the men being divided into gangs of eight, with three reliefs in the twenty-four hours; that is to say, at six in the morning, at two in the afternoon, and at ten at night.† On two occasions, however, in February, 1833, and April, 1834, the works were seriously interrupted by riots among the English and Irish labourers.

Not only were the plans of the Company altered in regard to the docks, but also in regard to the railway. Failing to obtain from the North Hetton Coal Company and Lord Durham a satisfactory assurance that the Moorsley and Littleton coals should be shipped at Hartlepool, the Company were not prepared to continue their railway to its Parliamentary terminations; the main line was, therefore, carried no further than Salter's Lane, near Haswell, and the Littleton branch no further than the point of departure of the Thornley branch. The first engineer of the railway, Edward Steel, had been superseded in February, 1833, by Stephen Robinson, under whose superintendence the principal works were executed. These works consisted of the great Crimdon cutting—80 yards wide at the top in parts and 70 feet deep—from which upwards of 800,000 cubic yards of earth required to be excavated; the Hesleden Dene, Edderacres and Pespool embankments, respectively 85 feet, 70 feet and 60 feet in height,‡ and an embankment across Hart Warren, about two miles in length, forming a great ridge averaging 30 feet§ in height, the breadth at the top being just sufficient for

* Reprint of Sharp's *History of Hartlepool*, 1851, Supplement, pp. 14 and 15.

† *Home Tour*, vol. i., p. 319.

‡ Day's *Formation of Railways*, 1839, p. 37.

§ *Railway Magazine*, 1840, p. 382. The greatest height, according to the parliamentary plan, was 36½ feet.

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PLATE X.



T. Creswick (from a sketch by G. Balmer).

Hartlepool in 1835.

W. Finden, sc.

a single line of rails. An object of some interest at the time was an oblique arch at Hesleden Bank Top, half a mile from the present Hesleden Station, which carried the railway over a cart road leading from Church Hesleden to the village of Castle Eden Colliery.

The first part of the railway brought into use was the Thornley branch and that portion of the Littleton branch connecting it with the main line, some coals being conveyed on the 1st of January, 1835, from Thornley Colliery to Castle Eden.* On the 9th of June, the land water from the Slake was admitted into the Tide Harbour which, two days later, on the removal of a portion of the coffer-dam, cleansed the channel and lowered the bar.† The admission of the sea-water was attended with disastrous results, for the new dock gates “were lifted up and floated by the weight of water and the sea, rushing with tremendous force through the breach, bore down everything before it, inundating the whole extent of ground occupied.”‡

On the 1st of July, the “*Britannia*” of Sunderland, a collier of 156 register tonnage but carrying 232 tons, entered the port and cast her anchor in the Tide Harbour.§ On the 9th she was placed under the drops, which were similar in design to those at Middlesbrough, and having received a cargo of Thornley coals, brought by a temporary way over Hart Warren, on the east side of the great unfinished embankment between Crimdon and Hartlepool, proceeded to sea amidst the ringing of bells, the firing of cannon and the acclamations of the spectators.||

Some months had to elapse before the success of the undertaking was assured. In the meantime the outlook was by no means a bright one. Sir George Head, who visited Hartlepool in the summer of 1835, thus described the state of the works and the aspect of the town:—

“The whole space within the Tide Harbour appropriated to the site of the new docks, was a picture of watery devastation; the town, owing to the sudden discharge of the numerous bands of labourers, by whom it had been enlivened, seemed now desolate;—the persons connected with the operations had all departed,—the countenances of the remaining inhabitants were visibly dejected,—most of the new houses, amounting to one-third of the old town, and many in an imperfect state, were altogether abandoned.”¶

* *Durham Advertiser*, 2nd January, 1835.

† *Ibid.*, 12th June, 1835.

‡ Head's *Home Tour*, vol. i., pp. 320-321.

§ *Durham Advertiser*, 3rd July, 1835; *Minutes of Evidence on South Durham Junction Railway Bill*, 6th May, 1836.

|| Head's *Home Tour*, vol. i., p. 321.

¶ *Richmond's Local Records of Stockton*, p. 170.

For some months after the opening, the fine series of sluices, having a scouring power of 168 acres, played an important part in deepening the channel. They were, at this time, perhaps the most efficient in the world, consisting of six oblong apertures—in pairs—each of which was 4 feet 3 inches in height and 14 feet 8 inches in breadth. The sluice-gates—three to each aperture—were of cast-iron, sliding in brass grooves, and were raised by powerful double-handled cranes from the tops of the arches under which they were placed.* The system of sluicing at Hartlepool was applied with considerable success—the velocity and consequent transporting power of the current being such that, at a distance of 3,000 feet from the gates, it was capable of deepening the entrance of the Outer Harbour from 6 to 9 inches in two consecutive tides.† By the end of September there was a depth of 19 or 20 feet of water at spring tides in the old or Commissioners' Harbour, and, on the 24th of the month, a large vessel, the “*Mexico*,” of Sunderland, took in a cargo of 380 tons, and, drawing nearly 15 feet of water, was able to leave the harbour, with two or three feet of water to spare, an hour and a half before the turn of the tide.‡

Unfortunately, in October, a second disaster occurred, the paving in front of two of the sluices—down which the water rushed to the bottom of the basin—was torn up, owing to the masonry not having had time to set.§ The sluices were consequently laid off, and there was soon in the harbour an accumulation of many thousands of tons of sand, which, being washed out with the tide, threatened to choke up the entrance near the pier entirely. This sand having been removed by dredging, the harbour was, for nearly twelve months, kept clear by the scouring action of the third double sluice.||

The Pier and Port Commissioners, on their side, had repaired the pier and dredged the channel and, by sinking old keels, filling them with material from the dredger and covering them with loose rubble stones—the suggestion of one of their number—were constructing a jetty at a comparatively small cost which would counteract the tendency of the ebb tide to set towards the western or Stranton shore, and keep the water in the channel.

In November the great embankment across Hart Warren was closed. For half a mile, however, it was still 15 feet below its permanent level,

* Head's *Home Tour*, vol. i., p. 323; *Durham Advertiser*, 12th June, 1835.

† *Theory, Formation, and Construction of British and Foreign Harbours*, by Sir John Rennie, 1854, vol. ii., p. 153.

‡ *Tyne Mercury*, 29th September, 1835.

§ Reprint of Sharp's *History of Hartlepool*, 1851, Supplement, p. 19.

|| *Minutes of Evidence on South Durham Railway Bill*, 29th April, 1836, p. 11.

the supply of material for its completion having been stopped by the suspension of the works at the docks. Left unfinished at too steep an inclination for locomotive engines, this part of the railway had to be worked for a time by fixed engines.* The main line was opened to Haswell on the 23rd of the month, when some coals from South Hetton passed down it to Hartlepool.† There was a fall of 450 feet from Haswell to Hartlepool, a distance of $12\frac{1}{4}$ miles, the steepest gradient—that of Hesleden Bank—a self-acting incline, a mile and three quarters in length, being 1 in 34.‡ The line, with the exception of a short section between Hesleden Dene and Castle Eden, was a single one, laid with parallel rails of malleable iron, weighing 42 lbs. to the yard. The length of railway open at the end of 1835 was $14\frac{1}{2}$ miles, the area of water space available for shipping, $17\frac{1}{2}$ acres. There were two coal drops in use, and a third was being erected.

From these purely mineral lines let us turn to other important railways which were being formed for the conveyance of goods and passengers. On the Leeds and Selby Railway the chief engineering work was the tunnel through Richmond Hill, within three or four hundred yards of the western terminus. Commenced in November, 1831, it was finished in June, 1833. Walls, arch, and invert were of brick, the two fronts of stone. Additional foundations were required at certain points in consequence of the discovery of some old colliery workings beneath the excavations. The length of the tunnel was 700 yards; its width at the springing line of the arch, 22 feet; its height, from invert to soffit 19 feet, and from the level of the railway to the same point, 17 feet.§ Its greatest depth from the surface was 80 feet. Three shafts, up which the material excavated had been raised, were utilized for lighting as well as ventilating the tunnel. Shields of tinned copper, about 2 feet 6 inches square, were placed on the ground between the rails at such an angle as to catch the light coming directly down the shafts and reflect it along the tunnel,§ the walls and vault of which were whitewashed.||

The heaviest earthworks on the line were: a cutting through sandstone extending eastward for a mile and a half from Primrose valley in the township of Halton, and an embankment about the same length between

* *Minutes of Evidence on South Durham Railway Bill*, 28th April, 1836, p. 16.

† Lewis's *Topographical Dictionary of Great Britain*, 1844, vol. ii., p. 422; *Builder*, 4th April, 1846, p. 166.

‡ Whishaw's *Railways of Great Britain*, 1842, p. 176.

§ *Leeds Mercury*, 2nd March, 1833; *Railway Magazine*, February, 1837.

|| Head's *Home Tour*, p. 202.

the Ferrybridge and York road and Bonnyfield Lane. The deepest cutting (43 feet through limestone) was near Milford, and the highest embankment (54 feet) near Halton Dial. A peculiarity of the embankments was that, instead of being carried up with regular slopes, they had their sides faced to a curved batter, the chord-line of which formed an angle with the base of about 67 degrees.* The bridges—one of them, at Garforth, being a skew arch—were generally of bold design and excellent proportions. Other features of interest were the two jetties at Selby, constructed, in 1833, upon massive piles driven 25 feet into the bed of the river. Mr. Letellier, an



Elevation of E. Entrance.

Elevation of W. Entrance.

MARSH LANE TUNNEL, LEEDS.

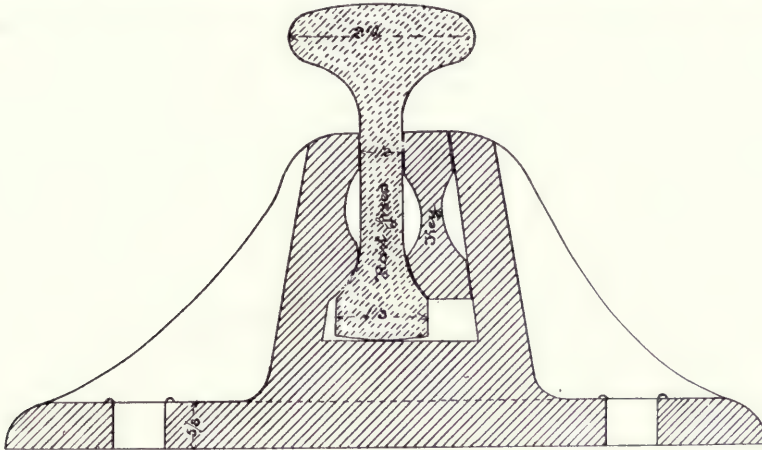
eminent French engineer, who visited the works of the Leeds and Selby Railway in the summer of 1833, considered them superior to any other works of the kind in England, both as to their general arrangement and to their details.† The resident engineer under whom they had been executed at first was Thomas Dyson. He resigned in July, 1832, and was succeeded by George Smith; under his superintendence the works were completed.

The railway was the first of the lines comprised in the North Eastern Railway system to be laid down from the commencement as a double track. It was, indeed, expected that the traffic would require four lines of

* Whishaw's *Railways of Great Britain*, 1842, p. 175.

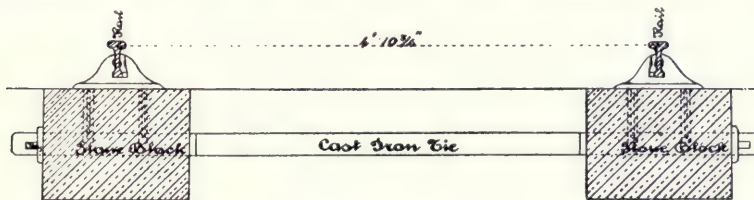
† *Leeds Mercury*, 31st August 1833.

rails, and the bridges, embankments and cuttings were all formed of sufficient width for this number. Malleable iron rails were used of the T or single parallel form weighing $36\frac{1}{2}$ lbs. to the yard. They were supported on stone blocks, but the chair, instead of being in direct contact with the surface of



SECTION OF LEEDS AND SELBY CHAIR, SHOWING THE RAIL AND KEY.

the stone, was seated on a sheet of Borrodail's patent felt and then secured by jagged bolts to the block. By this means the friction between the chair and the block was prevented and a certain elasticity given to the road. On some portions of the line the stone blocks were continuous under the rails,



SECTION OF LEEDS AND SELBY RAILWAY.

being 3 feet long, 16 inches wide and 12 inches thick. Iron ties running across the track at intervals passed through the blocks and kept the rail in position.* The gauge of the way was the standard one, the intermediate space at the Leeds Station was 5 feet, in the tunnel 4 feet $8\frac{1}{2}$ inches and at other parts of the line, 6 feet 6 inches.

* Whishaw's *Analysis of Railways*, 1837, p. 268.

One line of rails having been completed, it was decided to open the railway on the 22nd of September, 1834, so that visitors from Leeds to the three days' musical festival, which was to be held at Hull the same week, might avail themselves of the new travelling facilities. A train of four open carriages, attached to one of Fenton, Murray & Jackson's engines—the "Nelson"—passed along the line on the 18th, conveying a party of the directors and their friends to Selby and back.

The train, on the opening day, consisted of three first class carriages, the "Juno," the "Diana" and the "Vesta"—yellow-painted vehicles with drab linings and plate-glass windows—and six open second class carriages, drawn, like the first train, by the "Nelson" engine. Filled with passengers to the number of 156, it started from Marsh Lane Station about 6:30 a.m., the guards in charge of it dressed in "suits of green livery," with brass plates on their hats bearing the name of the Company. The hour of departure had been fixed for six o'clock, that passengers might reach Selby before the steam-packet left for Hull. A large number of sight-seers—20,000 according to one account—had assembled between Leeds and the village of Halton to witness the progress of the train, which, as it happened, was not a very triumphal one. A few chains from Marsh Lane there was a rising gradient of 1 in 218 and, as the rails were slippery with rain, the wheels of the engine began to "surge" or turn round without advancing. Ashes were strewn on the rails which, of course, had the effect of increasing the friction. It took seven or eight minutes to get through the tunnel, the gradient in which was 1 in 349, and forty minutes to travel the first 2 miles. As the line continued to rise to the summit level on gradients of 1 in 160 and 1 in 168, it was decided to drop one of the second class carriages and stow the passengers in the other five. Still the progress of the engine was so slow as to excite the jeers and laughter of the spectators who called out to the police officers and enginemmen "to put their shoulders to and push her along." Past Crossgates, where the railway received its first feeder, the Manston Colliery line, the train crawled up to the summit level on Brown Moor, having been an hour and ten minutes in going $4\frac{1}{2}$ miles: then, as the weather cleared up, the pace improved, 2 miles being run in fourteen minutes, and when, a little beyond Garforth the line, passing through a district of great natural beauty, began to fall towards Selby at an inclination of 1 in 180 for $2\frac{1}{2}$ miles and of 1 in 186 for $3\frac{1}{4}$ miles, the engine shot away at the rate of 20 miles an hour, and covered the last $13\frac{1}{2}$ miles in forty-two minutes, arriving at Selby a little before nine o'clock. The return journey, which began at

ten minutes past eleven o'clock, was performed in an hour and sixteen minutes.* The crowd that saluted the train on its arrival at Leeds is stated to have numbered between 40,000 and 50,000 persons.

The following day the Company began running an afternoon as well as a morning train between Leeds and Selby, the time occupied by the journey being one hour and five minutes. An omnibus conveyed passengers from the Company's office in Kirkgate to Marsh Lane for 4d. The fare from Leeds to Selby was 3s. first class and 2s. second class [$1\frac{4}{5}$ d. and $1\frac{1}{5}$ d. per mile], and by arrangement with the Selby Packet Company and a coach proprietor, passengers might be booked through to Hull for 5s. and 3s., and to York for 7s. and 4s. 6d. The journey from Selby to Hull (43 miles by water) was sometimes attended with considerable inconvenience. As the navigation of the Ouse and Humber was liable to obstruction from shoals and sandbanks, it not unfrequently happened, at neap tides, that the steamboat grounded. On such occasions the passengers were called upon to assist in keeping the vessel going to prevent her from lying quietly down on the mud. Whenever, in a coarse, gruff voice, the captain gave emphatic word of command, "Rowl her," the crowd, like sheep at the bark of a dog, walked across the deck, treading on one another's heels and suffering much personal inconvenience. At the same time they hauled upon a rope, previously sent on shore and made fast to post or tree, till the vessel was disengaged from her soft bed and again afloat in a channel nearer the shore.† There they might lie for two or even four hours. The trip from Selby to Hull was usually performed by the steamboats in about four and a half or five hours, but this time was not unfrequently exceeded when the wind was against them or they had to contend with a flowing tide—a contingency arising from the fact of the hour of departure being fixed. As the steamboats from Hull to Selby did not leave till "about a quarter flood," they always went down with the tide, the time occupied by the trip being about four hours:‡ on one occasion, at least, some passengers who left Hull by the "Sovereign" at 6.15 a.m., arrived in Leeds at 10.45 a.m.§

During the first four days 779 persons travelled from Leeds to Selby and 741 from Selby to Leeds, the receipts from these passengers amounting to £178.|| To many of the travellers by rail, the tunnel—the only one in the

* Dodsley's *Annual Register*, vol. lxxvi., pp. 150-51; Parson's *Tourist's Companion*, 1835, p. 78; *Leeds Mercury*, 27th September, 1834.

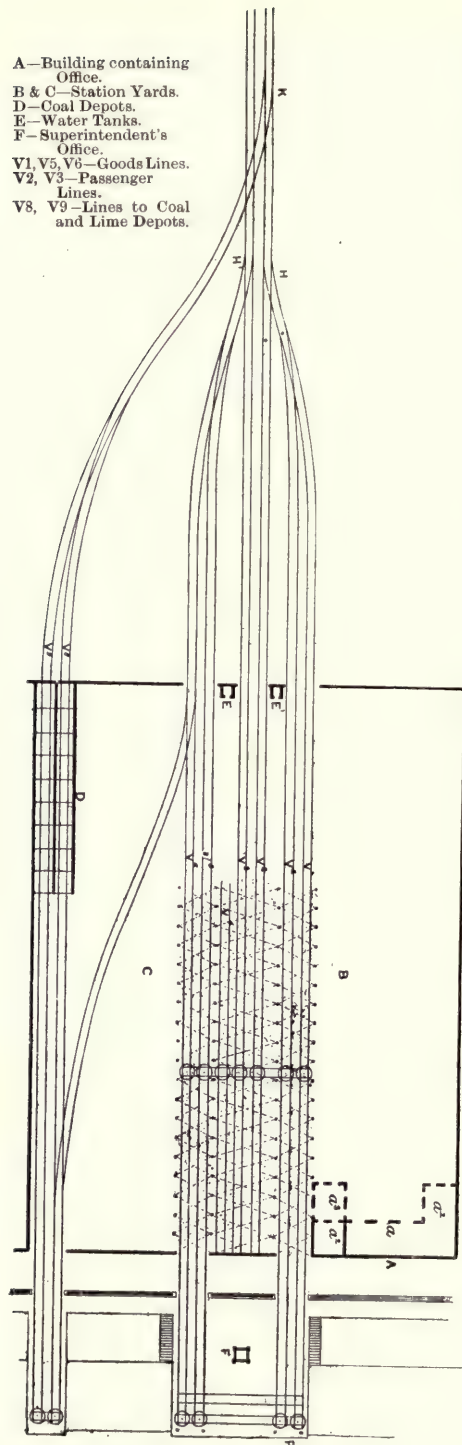
† Head's *Home Tour*, vol. i., p. 208.

‡ *Minutes of Evidence on the Hull and Selby Railway Bill*, 1836, p. 15.

§ *Leeds Mercury*, 7th March, 1835.

|| Parson's *Tourist's Companion*, 1835, p. 79.

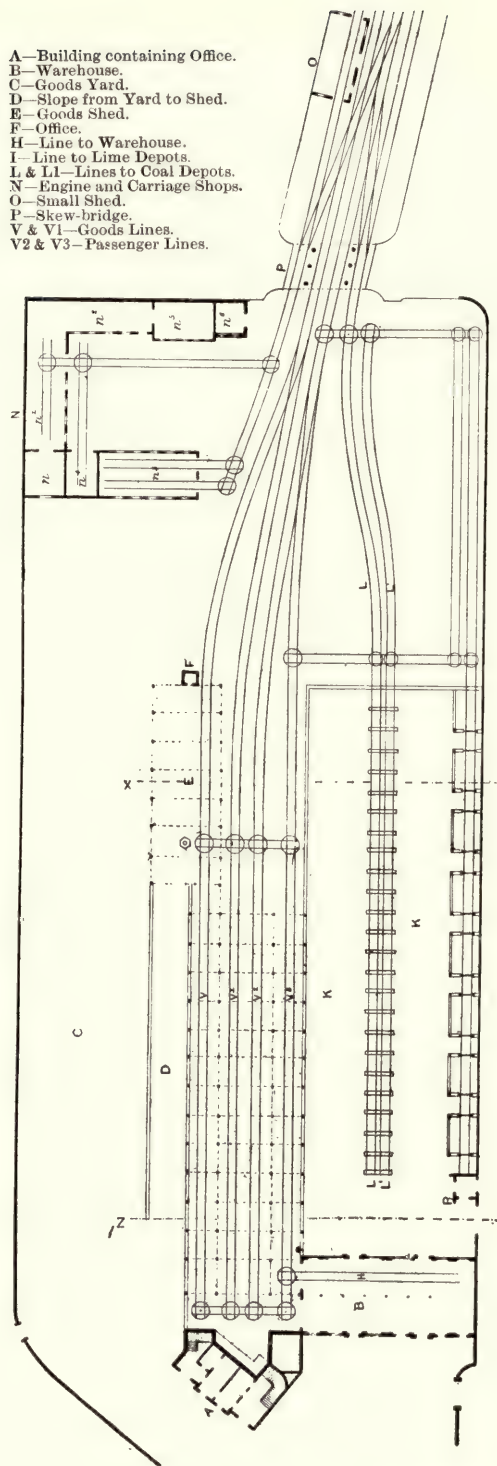
- A—Building containing Office.
B & C—Station Yards.
D—Coal Depots.
E—Water Tanks.
F—Superintendent's Office.
V1, V5, V6—Goods Lines.
V2, V3—Passenger Lines.
V8, V9—Lines to Coal and Lime Depots.



From Brees' "Railway Practice," 1847, Pl. 48.

SELBY STATION PLAN.

- A—Building containing Office.
B—Warehouse.
C—Goods Yard.
D—Slope from Yard to Shed.
E—Goods Shed.
F—Office.
H—Line to Warehouse.
I—Line to Lime Depots.
L & L1—Lines to Coal Depots.
N—Engine and Carriage Shops.
O—Small Shed.
P—Skew-bridge.
V & V1—Goods Lines.
V2 & V3—Passenger Lines.



B. R. Davies, sc.

LEEDS STATION PLAN.

country through which passengers were drawn by a locomotive engine—had terrors of no ordinary kind. To quote from one descriptive paragraph: “We were immediately enveloped in total darkness, and every one of the carriages filled with smoke and steam to a most annoying degree. Though we were but a few minutes going through, such was the nuisance, we thought it an hour.” The same railway passenger was there on one occasion when the train struck against some scaffolding which had been used to whitewash the tunnel. “The crash,” he said, “sounded terrible; and the turning off of the steam resounded like the report of artillery; and both men and women were so alarmed and frightened that they declared their apprehensions of immediate death.”*

It was some months before the stations at Leeds and Selby were completed. They were really the first stations with any pretensions to architectural character within the bounds of the North Eastern Railway system. Fortunately one of them—at Selby—still remains, not greatly changed, though now devoted exclusively to goods traffic, as an interesting example of an early railway terminus. Built at a cost respectively of £18,300 and £10,300,† these stations consisted of sheds, of simple yet elegant design, thrown over the various lines, with warehouses and offices adjoining, and spacious yards in which were coal and lime depôts. The trussed timber roofs of the sheds, each in three compartments, were supported on cast-iron columns, through which rain water was conveyed to underground tanks for the use of the locomotive engines. The length of the shed at Leeds was about 197 feet and that at Selby about 240 feet. In the former there were four lines of rails, and in the latter six: of these, two were for carriages and the others for waggons, the stations serving for both goods and passengers. In neither station were there any platforms or waiting rooms. Passengers waiting for the trains at Leeds were kept under the portico or station shed.‡ The booking-office at Leeds was on the ground floor of a building facing Marsh Lane, the passengers having to ascend a staircase to the railway, which was on a level with the first floor. At Selby the booking-office was on the north side of the railway, in the old house previously occupied by Christopher Paver, which also served as the residence of the superintendent.

Three months after the opening ceremony, the laying of the north line of rails was finished and, on the 15th of December, 1834, the railway was

* *Mechanics Magazine*, 1835, p. 277. † *Second Report on Railways*, 1839; Qn. 3,938, p. 163.

‡ Brees' *Railway Practice*, 1847, p. ciii.

opened for the carriage of goods,* an event which was immediately followed by a reduction in the dues of the Aire and Calder Navigation. A third jetty was erected at Selby and fitted with coal spouts, which were ready for use by the end of January, 1835.† A month later a cargo of coals from Manston Colliery was shipped on board the schooner “Audus” for Rochester, being the first coals sent southward from Selby.‡

The effect of the railway in developing the communication between two towns was soon seen. While the number of persons going and coming by



J. W. Carmichael, del.

WETHERAL BRIDGE.

T. A. Prior, sc.

coach during the summer did not previously average 400 weekly, the average number by the railway during the summer of 1835 was 3,500. During the first year the Company carried 100,913 passengers, the receipts from this source of traffic amounting to £11,947.§

On the Newcastle and Carlisle Railway—a line for passengers and goods as well as for minerals—were achieved some of the engineering triumphs of

* Mayhall's *Annals of Yorkshire*, vol. i., p. 360.

† *Leeds Mercury*, 31st January, 1835.

‡ *Ibid.*, 5th March, 1835.

§ *Manchester Chronicle*, 3rd October, 1835.

the time. Chief among these was the Wetheral Bridge, built by W. S. Denton from the designs of Francis Giles—a bridge 564 feet in length and 25 feet in exterior width, having five semi-circular arches of 80 feet span each, which carried the railway across the Eden at a height of 95 feet above the summer level of the river. Commenced on the 25th of March, 1830, it was finished on the 12th of August, 1834, when it was used for the passage of excavated material from the cutting on the east to the embankments on the west of the Eden. Little inferior to the Wetheral Bridge in architectural design was the Corby Viaduct (1831-4), 480 feet in length and about 70 feet in height, composed of seven arches of 40 feet span each, crossing the Drybeck Valley. A third work of structural beauty was a skew-bridge which crossed the river Gelt at an angle of 63° —one of the largest of the kind in the kingdom, supporting the railway on three arches of 30 feet span each at a height of 64 feet from the bed of the stream.

Among the earthworks on the line, the most remarkable was a cutting nearly a mile long through the Cowran Hills, considered at the time the largest in England: its depth at one part being 110 feet and, for upwards of 1,500 feet, from 90 to 100 feet, while its width varied from 26 feet at the level of the rails to 305 feet between the highest points. The sides were carried up with slopes of $1\frac{1}{2}$ to 1 and below the slopes, for 700 feet, was a retaining wall on each side, built of stone, 14 feet high. It had originally been intended to tunnel through the hills, but the sandy nature of the soil and the numerous springs encountered at the commencement of the work led the engineer in August, 1832, to substitute for the tunnel an open cutting, requiring the excavation of nearly a million cubic yards of earth.

Other engineering features were: an embankment over the Hellbeck, 70 feet in height above the bed of the stream; a river wall, three quarters of a mile in length and 26 feet in height above the low-water level, forming a roadway past Wylam Scars, which rose 80 feet above it; and two short tunnels, one at Farnley Scars, near Corbridge, 170 yards long, 15 feet high and 14 feet wide, and another at Whitcheater, near Haltwhistle, 202 yards long.

After directing the execution of the works for nearly three years, Mr. Giles found that his connection with the Company was incompatible with his other professional engagements. The duties of his position were undertaken—from the 1st of July, 1833—by a committee of management consisting of Benjamin Thompson, Nicholas Wood and George Johnson, all of them mining engineers. Under this committee, Mr. Blackmore continued

to act as resident engineer, Mr. Giles' services being retained as consulting engineer. Some of the works had, previous to this time, been suspended for want of funds, but the Company having borrowed £100,000 from the Exchequer Loan Commissioners, were able to resume them in the month of August, 1833.

When the time came for laying the first portion of the line—between Blaydon and Hexham—the question of motive power, which had been decided ten years before in favour of horses, came up again for consideration. If horses were used, four sidings would be required to the mile between Prudhoe Haughs and Hexham, where it was proposed to lay down a single line, but if locomotive engines were used, one siding would suffice—a saving in the cost of formation of £672 14s. 2d. per mile.* For the last time probably in the history of the early lines, the comparative advantages of animal and steam traction were considered. No engineer in the country at this time knew more about railways and the various forms of motive power than one member of the committee—Nicholas Wood, who had played a distinguished part in the introduction of steam locomotion—and, with his experience to guide them, the directors could have little difficulty in coming to an important decision—the adoption of steam locomotive power. In November, 1834, the directors gave notice of their intention to apply to Parliament for leave to rescind the clause in their Act prohibiting the use of locomotive engines on the line. Taking for granted the consent of the Legislature, they ordered three locomotive engines, one from R. Stephenson & Co., another from R. & W. Hawthorn, and a third from Edward Bury. One development led to another. As horses, travelling at different speeds, would necessarily interfere with the regular running of locomotive engines, the free occupation of the line by the public became impracticable, and the Company realised, somewhat tardily, that the carrying trade on the railway would have to be kept in their own hands.

By the end of November, 1834, the railway was ready for use between Hexham and Blaydon, $4\frac{3}{4}$ miles of it being a double line and 12 miles a single line. The rails, weighing 42 lbs. to the yard, were of malleable iron in 15 feet lengths, fish-bellied in form, with half-lapped joints, manufactured at the Dowlais and Ebbw works in South Wales in accordance with William Losh's patent. They were supported on stone blocks, measuring approximately $24 \times 18 \times 9$ inches and $24 \times 18 \times 12$ inches. On the sharp curves which characterised this line the rails were kept in gauge by iron

* Proceedings of the Committee of Management, p. 150.



J. W. Carmichael, del.

The Cowran Cut, near How Mill.

L. Husse, sc.

ties placed at intervals of 10 yards. Resting on the stone blocks they passed underneath the rails and were turned up at each end.* The gauge of the line was 4 feet 8 inches. From the 26th of November, nearly 17 miles of the railway were virtually open for goods traffic,† and, by the end of the year, 115½ tons of lead had been carried for Mr. T. W. Beaumont from Stocksfield to Blaydon‡ and 491½ tons from Hexham to Blaydon, in waggons drawn by horses.

On the 9th of March, 1835, the same portion of the line was opened for passenger traffic by a ceremonial trip from Blaydon to Hexham and back. Tickets were issued to about 600 persons, who were accommodated in two trains, each consisting of three railway carriages, several gentlemen's carriages mounted on trucks and a number of waggons fitted up with seats. To the first train was attached the "Rapid," one of R. Stephenson & Company's engines, and to the second the "Comet," one of R. & W. Hawthorn's. Like the engines, the carriages of the Company had each a name, those in the rear of the "Rapid" being the "Expedition," the "Sociable" and the "Prospect," and those behind the "Comet," the "Despatch," the "Industry" and the "Transit."§ The trains, which had been detained about half an hour waiting for the arrival of the Mayor of Newcastle and a party of ladies and gentlemen in the Corporation barge, left Blaydon about eleven o'clock, accompanied by bands of music and attended by guards "in handsome liveries." Unfortunately, the engines, while detained at Blaydon, had blown off a great deal of steam and it was necessary to stop at Eltringham Scar for the purpose of replenishing their water tanks. Further delay was caused by some waggons getting off the line, and it was not until nearly half-past one o'clock that the trains, passing under a triumphal arch which had been erected for the occasion, drew up at Hexham.

About twenty minutes past three o'clock the trains left Hexham and, travelling at what the *Tyne Mercury* called "a very rapid and agreeable pace," arrived at Blaydon about twenty minutes to four. The following day a regular service of trains was established, passengers being conveyed from Blaydon to Hexham at 8 a.m. and 2 p.m. and from Hexham to Blaydon at 11 a.m. and 5 p.m.

* *Arcana of Science and Art*, 1837, p. 46; Whishaw's *Railways of Great Britain*, 1842, p. 340.

† *Tyne Mercury*, 2nd December, 1834.

‡ The Stanhope and Tyne Railway Co. had counted upon getting the carriage of Mr. Beaumont's lead, and it was with no little disappointment that their agent at Stanhope referred to the grievous report of Beaumont's lead having to be conveyed by carts to Stocksfield and thence to Blaydon by the Carlisle Railway. [Thos. Willis to T. E. Harrison, 2nd December, 1834.]

§ *Durham Advertiser*, 14th March, 1835.

Coaches ran in connection with the trains at Blaydon from the office of Joseph Hindhaugh, St. Nicholas' Square, Newcastle.* Goods went by steamboat and were forwarded once a day from Newcastle Quay and Blaydon.† On Sundays a train left Blaydon at 8 a.m. and returned from Hexham at 5 p.m.

"What person," the *Tyne Mercury* had asked on the 16th of November, 1824, "would ever think of *paying anything* to be conveyed from Hexham to Newcastle in something like a coal waggon upon a dreary waggonway, and be dragged on the greater part of the distance by a roaring steam-engine?" To the writer the thing was too ridiculous to dwell upon, especially when it was known that a person might go from Hexham in three hours by a coach for 3s. or 4s. But how great was the change of opinion in the short space of ten years. Not only did the public show itself eager to travel by the railway in thousands, but the Carlisle coach itself formed part of the train as far as Hexham.‡

Soon after the opening, the directors found that trouble was brewing for them. With the acquiescence of the landowners (with one exception), they had employed steam-power on the line. The exception was Mr. Charles Bacon Grey. He had left Styford, and yet, of all the landowners concerned, he only had refused leave to the Company to make use of locomotive engines. Regardless of the wishes and interests of the public, he applied to the Court of Chancery and obtained an injunction against the Company. A petition, signed by upwards of 2,000 of the principal inhabitants of Hexham and district, was forwarded to him, but he held to his purpose and, at five o'clock on March 28th, 1835, the injunction was served on the clerk of the Company.§ The step taken by Mr. Bacon Grey was universally reprobated. At an influential meeting, held in Newcastle on the 6th of April, the Mayor presiding, resolutions were passed in favour of the use of locomotive engines and in support of the bill then before Parliament for the repeal of the restrictive clause in the original Act.§ Before the storm of indignation which gathered about him, Mr. Bacon Grey was

* The Newcastle and Carlisle Railway Company soon afterwards opened a coach office of their own at 50, Westgate Street, from which passengers were booked until 1839. This early railway office stood on the south side of Westgate Street, near St. John's Church, and was removed for the purpose of forming West Grainger Street. Its site, at the junction of the two thoroughfares, is now occupied by the footpath on the west side of West Grainger Street and a portion of the roadway.

† *Tyne Mercury*, 10th March, 1835.

§ *Tyne Mercury*, 31st March, 1835.

‡ Whishaw's *Analysis of Railways*, 1837, p. 287.

|| *Ibid.*, 7th April, 1835.

obliged to bend and, after subjecting the public for several weeks to much inconvenience, he withdrew his opposition. The trains began running again on the 6th of May.*

This Blaydon-for-Newcastle arrangement could only be temporary. There were obvious reasons for proceeding at once with the works between Blaydon and Newcastle which had been postponed by resolution of the 4th of February, 1834. But a question remained to be settled—at what point should the railway cross the river? Scotswood was the point on the Parliamentary line but, by a clause in the Act of 1829, they were prohibited from charging pontage for any bridge erected within 1,000 yards of the Suspension Bridge. A site lower down had been suggested and considered for over a year. The railway, it was shown, rising gradually from Dunston Haugh to the western boundary of the Redheugh estate, would cross the river by a bridge at an elevation of 20 feet above the high-water level of ordinary spring tides to the Elswick grounds, a little west of the Shot Tower, and ascending in a north-easterly direction to the north side of the Infirmary on gradients which would require this portion of the line to be worked as a stationary engine plane, pass through the Forth Field to the Spital—a piece of open ground now occupied by that portion of Neville Street lying between the corner of Pink Lane and Stephenson's Monument, by the buildings on the north side of the street within these limits and by part of the west end of the Central Station and hotel. At the same time as they asked Parliament to sanction the use of locomotive engines on the line, the Company applied for power to erect this bridge.

By a clause in the Blaydon, Gateshead and Hebburn Railway Act of 1834, it was provided that the Newcastle and Carlisle Railway Company might form any part of the line between Blaydon and Gateshead, subject to certain stipulations. On giving notice of their intention to exercise this power they had met with opposition from the Blaydon and Hebburn Company. Competition, it was stated, which did not exist when the clause was agreed to, had so far altered the situation of the Company that it would be more consonant with their interests to give up the undertaking altogether than to acquiesce in the proposed curtailment of it. Some friction, in consequence, took place between the two Companies. Ultimately it was arranged that the Newcastle and Carlisle Company should make the line from Blaydon to the east bank of the Derwent, and the Blaydon and Hebburn Company from the latter point to Gateshead.

* *Durham Advertiser*, 8th May, 1835.

The Newcastle and Carlisle Railway Act, which received the Royal Assent on the 17th of June, 1835, empowered the Company to use locomotive engines but compelled them to burn coke instead of coal under a penalty of £20,* sanctioned the continuation of their line from Blaydon to Gateshead, and thence by means of a bridge across the Tyne to the Spital in Newcastle, but restrained them, in case the Blaydon and Hebburn Company should complete that portion of their railway between the Team and the Derwent within a year, from making their own line between the same points without the consent of the other Company.

After a year's vacillation, the Blaydon, Gateshead and Hebburn Railway Company decided to break ground. Towards the end of May, 1835, they let the contract for the earthwork on a section of the main line between the Team and Derwent, a mile and three quarters in length—a section presenting no engineering difficulties yet destined to be the sole achievement of a Company whose motto was “*Ars Victrix*.” A new project took the wind out of their sails. In May, 1835, Messrs. John and Robert William Brandling, the lessees of a coal district extending from South Shields along the sea-coast in a south-easterly direction for four miles and a half and in a westerly direction for about seven miles, had issued a prospectus for a railway to connect Gateshead with South Shields and Monkwearmouth, commencing at the old Rectory, Gateshead, and following nearly the same direction as the Blaydon and Hebburn line to Heworth Dene, but at a higher level. The line had been examined, and the estimates of cost and revenue formed, by George Stephenson and Nicholas Wood, assisted by Robert Stephenson. Realising how much the new line would endanger the prospects of their own, the Blaydon and Hebburn Company had tried to induce the projector of the railway—Mr. R. W. Brandling—to modify his scheme, proposing that he should substitute for his line from Gateshead to Leam Lane a line from their railway at Heworth Dene to the same point, and offering to pay him the difference in cost—estimated at £5,401—between the line as suggested and a corresponding line at the higher level.† Mr. Brandling, on his side, had proposed to the Blaydon and Hebburn Company that they should make a connection with his Gateshead dépôt and, abandoning their line to the eastward, form jointly with the proprietors of Brandling's Junction Railway that portion of his line between Gateshead and the Springwell waggonway,

* Clause 26.

† Minutes of Blaydon, Gateshead and Hebburn Railway Co., 16th May, 1835.

the waggonway being utilized for taking them to Jarrow.* Negotiations having come to an end, Mr. Brandling had pushed forward his scheme. On the 30th of July, 1835, he had obtained an Act which empowered him, in conjunction with his brother, John Brandling, to purchase and take leases of lands for the purposes of the railway, and enabled the Dean and Chapter of Durham and other landed proprietors to grant leases for 99 years. He had then made arrangements with the landowners, obtaining a right of passage through their estates on payment of way-leave rents amounting altogether to £2,069 16s. 6d. per annum,† and, provided with a report from Robert Stephenson and the younger Brunel stating that, in their opinion, his plan of communication between the three towns was in every respect preferable to the scheme of the Blaydon and Hebburn Company for a joint railway, he had called meetings in Newcastle, South Shields and Sunderland for the purpose of promoting the measure. On the 7th of September, 1835, a company had been formed under the title of the Brandling Junction Railway Company, with a capital of £110,000, to acquire the rights and powers possessed by the Messrs. Brandling under their Act and the way-leave contracts into which they had entered, the terms of the transfer being the repayment of the expenses incurred in procuring the Act and a yearly rent of £200 for every mile of railway, amounting in the whole to £3,434. 5s. 0d. per annum,‡ which included a way-leave through Mr. R. W. Brandling's freehold estate of Felling for nearly half a mile but left the Company liable for the payment of compensation to the occupiers of the land of double the annual value for surface damage.§ The Brandlings pocketed by this transaction an annual rent of £1,364 8s. 6d., equivalent to interest at five per cent. on a capital of £27,288 10s. 0d. Shortly afterwards, the Gateshead, South Shields and Monkwearmouth Railway Company was formed, under the auspices of the Stanhope and Tyne Railway Company, with a capital of £150,000, the objects of the promoters being almost identical with those of the Brandling Junction Company. Negotiations were proceeding between the directors of this Company and the Blaydon and Hebburn Company with a view to effecting a junction between the two lines at Nether Heworth, when a proposition came from the Brandling Junction Company that representatives of the two companies should meet

* Minutes of Blaydon, Gateshead, and Hebburn Railway Co., 16th May, 1835.

† *The Reply of the Directors of the Brandling Junction Railway Company*, 1843, p. 4.

‡ The amount actually paid in 1843 was £3,436 16s. 6d.

§ *The Reply of the Directors of the Brandling Junction Railway Company*, 1843, p. 4.

to confer on the subject of a general arrangement which might prevent a collision of interests. The meeting took place on the 17th of October, 1835, when the following plan was suggested:—

That the Blaydon and Hebburn Railway Company should adopt a higher line, passing between Gateshead Park and the turnpike road from Gateshead to Heworth, on having the new line secured to them as a Parliamentary line on the same terms as their present line; that at Heworth they should approach their Parliamentary line and descend by it to Jarrow Quay; that the line of the Brandling Junction Railway should commence at Heworth and proceed to Monkwearmouth, intersecting the Stanhope Railway at a point to be agreed on; that the Brandling Junction Company should use the Stanhope and Tyne Railway to a point near South Shields, and from this point make a branch railway to their shipping-place.*

The suggested arrangement was still under discussion when a proposal from the Newcastle and Carlisle Company to take over the works and powers and fulfil the engagements of the Blaydon Company† altered the complexion of affairs. The proposal seemed to the harassed Company the best solution of their difficulties, and by the end of the year terms were practically settled. According to these, each shareholder was to get back the money advanced on calls, with interest at 5 per cent. from the date of payment, and also a premium of £3 per share.

The works on the Durham Junction Railway were limited to that portion of the Parliamentary line between Washington and the Seaham Railway at Rainton Meadows. The embankments and cuttings between these points were, most of them, executed in 1835. Towards the close of this year the directors were considering a tender, dated 13th November, 1835, for a stone bridge of simple yet picturesque design over the river Wear. This tender was sent in by Messrs. John Gibb & Son, of Aberdeen—grandfather and father of Sir George Gibb—to whom the contract was eventually let.

As the Durham and Sunderland Railway was intended to be worked entirely by stationary engines, it was laid out in a series of inclined planes, varying in inclination from 1 in 60 to 1 in 264. The first object of the directors was to get the railway completed as far as the newly-opened colliery at Haswell and the colliery then sinking at Belmont. To do this involved the construction of 14 miles of line. The works were not of an unusually heavy character. They comprised embankments of 16, 25 and 36

* Minutes of the Blaydon, Gateshead, and Hebburn Railway Co., 17th October, 1835.

† *Ibid.*, 13th November, 1835.

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PLATE XII.



G. Dodgson, del.

Bridge in Eskdale.

Chas. Sims, sc.

feet at Eppleton, at Murton Moor and near Seaton; cuttings of 18, 25 and 28 feet near Seaton, Murton Junction and Cherry Knowle; * skew-bridges at Moorsley Lane, South Hetton and Hendon and over the Stockton turnpike road near Ryhope Dene; a short tunnel under the junction of the Hetton and Elemore waggonways; and flank walls, 6 feet thick, in Barrack Street, Sunderland. On one part of the line the works had been suspended from March to August, in consequence of a legal difficulty. The Company had taken way-leave through a piece of ground at Little Eppleton belonging to George Townshend Fox, and when the time came for carrying the railway through the estate they received notice that the Hetton Coal Company held a lease of the ground which had fifteen years to run. The sum demanded for trespass was £5,000. The Company were placed in this predicament that they would either have to make terms with the Hetton Company or alter the course of their line and restore the land already excavated to its former condition. Having instructed the engineer to make a survey for another line of road, with estimates of cost, etc., and having conferred on the practicability of using a portion of the Seaham Railway until the Coal Company's lease had expired, the directors ultimately agreed to pay to the Hetton Company the sum of £1,000 and to take the Little Eppleton Farm and Mansion House off their hands at the rent paid to Mr. Fox.†

The works on the Whitby and Pickering Railway were naturally lighter than the works on a locomotive-engine line. The most striking feature of the railway was its course, which, following the windings of the picturesque dales between Whitby and Pickering presented an almost continuous series of curves, some of these having a radius of only 10 or 12 chains.‡ There were nine bridges—light and elegant structures of wood—over the Esk between Ruswarp and Grosmont, the largest, built at a cost of £1,575, being 312 feet in length. It was to avoid crossing the Esk at a point where it was navigable, and consequently where two swing or draw-bridges would have had to be built within a short distance of each other, that the river was diverted at Larpool Flat—a work accomplished on the 1st of January, 1834.§ At one end of the vale of Goathland was a short tunnel with castellated entrance, 120 yards long, 14 feet high and 10 feet wide;|| at the

* Day's *Observations on the Durham and Sunderland Railway*, 1836, pp. 39-62

† *Ibid.*, pp. 30-88; Minutes of the Durham and Sunderland Railway Co., 6th March and 21st August, 1835.

‡ Whishaw's *Railways of Great Britain*, 1841, p. 428. § *Tyne Mercury*, 14th January, 1834.

|| *Scenery on the Whitby and Pickering Railway*, 1836, p. 83.

other, a self-acting inclined plane, 1,500 yards in length, rising first at the rate of 1 in 10·89 feet, and then at the rate of 1 in 28·88 feet.* The rails laid down were fish-bellied, weighing 40 lbs. to the yard, similar to those on the Stanhope and Tyne Railway except in one particular—the joints which, instead of being butt-ended, were half-lapped or scarfed.

For nearly a year, George Stephenson, as the engineer-in-chief of the Company, had directed the execution of the works, but in July, 1834, it was arranged that his assistant, Frederick Swanwick, should have the entire superintendence of the line,† except in case of emergency, when George Stephenson would proceed at once to Whitby and relieve him of the responsibility. The remaining contract—for the middle portion of the line—was let on the 1st of November. It comprised some difficult engineering work—the formation of the railway across Fen Bog (where the summit level was reached at a height of 520 feet above Whitby), and over much broken and unstable ground in Newton Dale. By the middle of May, 1835, the works from Whitby to the Whinstone Dyke above the tunnel were so far advanced that the directors decided to open this portion of the line for traffic and on the 15th, went over it for the first time in the “Premier” coach. On the 8th of June this coach began running regularly between the Railway Office in the shipyards near Whitby and the Tunnel Inn at Grosmont, a distance of $6\frac{1}{4}$ miles, the service consisting at first of two trips a day in each direction from the Monday to the Friday inclusive, and of three trips on the Saturday,‡ the fares being 1s. outside and 1s. 3d. inside. A month later, on Saturday, the 18th of July, a second class coach was started for the convenience of the market people, the fares by this coach being 6d. The Company announced that persons wishing to travel at other than the stated times would be accommodated with a coach on forming a party for the purpose. They might

* Whishaw's *Railways of Great Britain*, 1842, p. 429. Neither the tunnel nor the inclined plane is now used for the purpose of the railway.

† Minutes of Whitby and Pickering Railway Co., 10th July, 1834. Attempts have been made in certain engineering quarters to belittle the work of George Stephenson by magnifying that of his assistants. In a memoir on Frederick Swanwick, contributed to the Proceedings of the Institution of Civil Engineers, we are informed that “in 1832, when Frederick Swanwick was at the early age of twenty-two, Mr. Stephenson shewed his remarkable confidence in his pupil's powers by entrusting him not only with the execution but with the selection of route—merely throwing out a suggestion as to its direction—and the entire planning of the Whitby and Pickering Railway. It is, indeed, not certain that Mr. Stephenson had even seen the ground, but he had some important work on hand and he gave his pupil *carte blanche* . . . not till the opening day did George Stephenson see the railway that he had fathered and completed by the hand of a pupil,” (vol. 85, pp. 403-404). As George Stephenson was certainly at Whitby and on the line of the railway in June, 1832, in August and September, 1833, and in July, 1834, and doubtless at other times, the whole of this imaginative statement must go by the board.

‡ *York Courant*, 11th June, 1835.

also proceed to Beckhole by railway on engaging an extra coach and paying an additional fare of 6d. each. Shortly afterwards, the Whitby Stone Company, in which George Stephenson was financially interested, connecting their quarries at Leaserigg with the railway by means of a self-acting inclined plane, began sending stone in considerable quantities down the line for shipment at Whitby.

The result of all this engineering activity in the North of England was that at the close of 1835, 168 miles of line were opened for traffic and 64 progressing rapidly towards completion.



CHAPTER IX.

THE LINKING OF THE TWO CAPITALS.

The movement for connecting the mining and manufacturing districts of Durham, Yorkshire and Cumberland with the seaports of the north-east coast was followed by a movement for establishing a railway communication with London and Edinburgh. It began at York, and was piloted by a man of strong intelligence and forceful character—George Hudson, a linen-draper in College Street, who had recently been coming to the front in the public life of the city. The starting-point was a meeting held in Tomlinson's Hotel (now the Londesborough Arms), 52, Low Petergate, on the 30th of December, 1833, when a Company was formed for the purpose of making a railway from York to Leeds. Three lines had been suggested: one, actually surveyed, by way of Tadcaster and Aberford; another by way of Thorparch, crossing the Wharfe between that place and Tadcaster; and a third proceeding to South Milford to join the Leeds and Selby Railway there.* In the expectation that the line would go by Tadcaster, the inhabitants of Knaresborough held a meeting on the 18th of February, 1834, to take measures for connecting their town with the proposed railway.† It was soon afterwards the opinion of the committee that the line should join the Leeds and Selby Railway at Garforth, as well as South Milford, in order to obtain a readier access to the collieries and shorten the distance between York and Leeds.‡ Goods intended for Leeds and the West Riding would go by Garforth, and those for Selby and the East Riding by South Milford. To enable the shareholders to decide the question of route, George Rennie, C.E., was engaged to examine the intervening district and report on the lines suggested. After making a careful survey—completed in September, 1834—he gave preference to the line by Tadcaster which, he proposed, should commence at the river Ouse, near the North Street Postern, pass behind Dringhouses, and proceed by way of the Askhams and Bilbrough, to Tadcaster, afterwards following

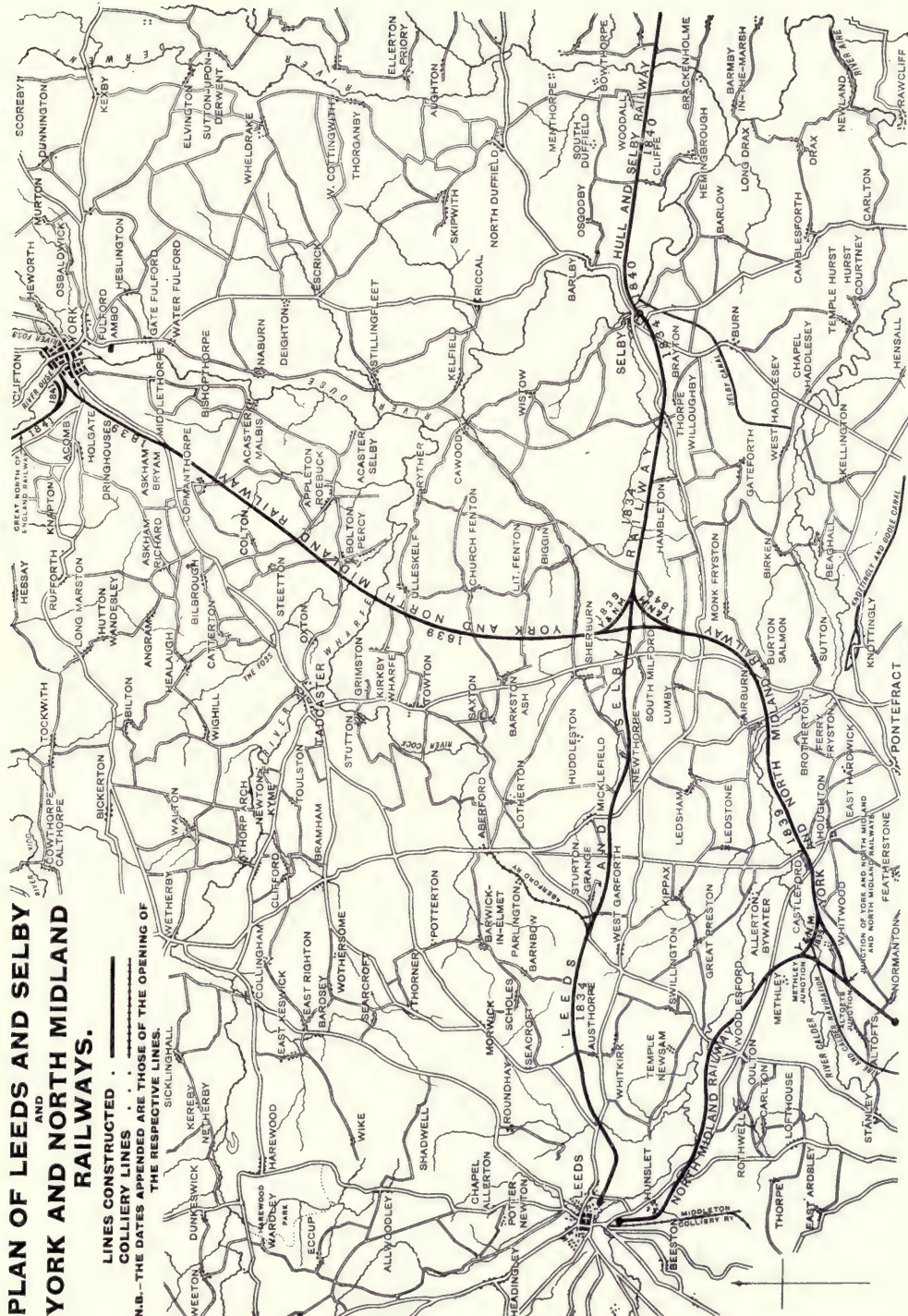
* *Yorkshire Gazette*, 4th January, 1834.

† *Leeds Mercury*, 22nd February, 1834.

‡ *Ibid.*, 1st March, 1834.

PLAN OF LEEDS AND SELBY AND YORK AND NORTH MIDLAND RAILWAYS.

LINES CONSTRUCTED . . .
COLLIERY LINES . . .
N.B.—THE DATES APPENDED ARE THOSE OF THE OPENING OF
THE RESPECTIVE LINES.



the valley of the Cock to Lotherton and Garforth, where it would join the Leeds and Selby line at a distance of about $17\frac{1}{2}$ miles from York.* When the Company met, on the 23rd of September, 1834, to consider the report of their engineer, they found that their scheme was likely to be a much more important one than they had at first contemplated. In the hands of some of the subscribers was a prospectus which had been issued in August, of a "Grand Northern Railway," projected by Nicholas Wilcox Cundy, to run from London to York by way of Bishop's Stortford, Cambridge, Peterborough, Stamford, Grantham, Newark, Lincoln, Gainsborough and Selby, with a branch from Cambridge through Newmarket, Bury St. Edmunds and Thetford to Norwich, and the question was already shaping itself in their minds, might not a line be selected, which would not only connect York with Leeds, but also form part of this Grand Northern Railway? Another factor which entered into the question of route was the proposal of the Whitby and Pickering Railway Company to extend their line to York. At their request George Stephenson had already surveyed two lines from Pickering to the city, one by way of Malton and the other by way of Easingwold with a branch from the latter to Tadcaster.† He had met George Hudson at Whitby and discussed with him the York and Leeds scheme,‡ and now, accompanied by the chairman and two of the directors, as well as by the solicitor of the Whitby Company, he attended the York meeting and set forth the advantages of a connection between the city and the harbour of Whitby, which he considered to be the best on the east coast.§ Though merely a member of a deputation, he allowed himself to be drawn into the general discussion, answering a number of questions submitted to him, chiefly relating to the locomotive equipment of a railway. Knaresborough, also, desirous of communicating by a branch with the railway, was represented by a deputation, which advocated the adoption of the route *viâ* Tadcaster. Notwithstanding the enthusiasm which prevailed, it was decided to postpone further measures until the committee had obtained more detailed information.

A week later Mr. Cundy came down to York and, on the 2nd of October, addressed a public meeting in the Guildhall, which passed a resolution in favour of his plan and appointed a local committee to co-operate with a central committee in London in promoting the scheme. Some of the more active members of the York and Leeds committee were also members of the York and London committee.

* *Yorkshireman*, 27th September, 1834.

† *Ibid.*

‡ *Herapath's Journal*, 1845, p. 1124.

§ *Yorkshireman*, 27th September, 1834.

A few weeks afterwards there was not only a Grand Northern but a Great Northern Railway in the field. This rival trunk line, which was projected by Joseph Gibbs, another engineer, commenced at Whitechapel and proceeded by way of Dunmow to Cambridge and thence through Lincoln and Selby to York, a distance of $188\frac{3}{4}$ miles, having, like Mr. Cundy's line, a branch to Norwich. Mr. Gibbs came north on the 20th of October and had a long interview with the committee.* The feasibility of forming at once a short section of the line, between York and Selby, in case sufficient funds should not be obtained for completing the whole scheme, was discussed, and Mr. Gibbs gave directions for the making of a survey of the proposed line which, instead of crossing the Ouse like Mr. Cundy's, and following the east bank of the river to the York and Malton road, kept to the west side of the river, running through Selby to Cawood and then crossing the Wharfe near its junction with the Ouse; proceeding afterwards by way of Bishopthorpe and past Middlethorpe to its termination at York near to South Parade.† Meanwhile a scheme was revived for a railway from York to Selby by way of the Fulfords, Naburn, Eserick, Stillingfleet, Riccall and Hemingbrough, and in the columns of the *York Herald* of the 15th of November, 1834, the promoters gave notice of their intention to apply to Parliament for an Act. The committee for promoting a railroad from London to York, who had been inclined to support Mr. Cundy, now employed Mr. James Walker, the engineer, to make a survey of the country generally between London and York and point out the line of railway which, in his opinion, was the best for connecting the two cities, having reference to the two schemes already brought forward. In his report dated the 30th of June, 1835,‡ he recommended a line by Bishop Stortford, Saffron Walden, Cambridge, Huntingdon, Peterborough, Market Deeping, Bourn, Lincoln, Gainsborough and Selby ($199\frac{3}{4}$ miles), with a branch to Norwich from the south of Cambridge. Between London and Cambridge the line took nearly the same direction as Mr. Cundy's and, between Selby and York, as Mr. Gibbs'. The Northern and Eastern Railway, as it was called, met with a fair measure of support, and the Railway Committee in York were induced to report in favour of it as the line with the best prospect of being carried into effect. They could not, however, shut their eyes to the difficulty of raising a capital of £4,000,000 for the construction of a line passing entirely through

* *Yorkshire Gazette*, 25th October, 1834. † *The Railway Times*, 1839, p. 461.

‡ Reprinted in *Railway Magazine*, January, 1836.

agricultural counties. The *Athenæum*, in throwing cold water on Mr. Gibbs' scheme, had shown how a series of manufacturing towns, beginning at Leeds and including Sheffield, Nottingham, Leicester, and Northampton, might all be connected with London by a railway from Leeds to the Birmingham railway below Northampton.* A railway had already been projected between Derby and the London and Birmingham line—the Midland Counties Railway—and the only link to complete the chain of communication was a railway from Derby to Leeds. In July, 1835, the subject of a Midland Railway to the north was under consideration in London and, at a meeting held on the 27th, George Stephenson was authorised to make a survey and submit plans. The result of these proceedings was the formation, in September, 1835, of the North Midland Railway Company.

The York and Leeds committee now saw that the time had come for action. They perceived that, by uniting with the North Midland Railway, they would accomplish the double object of establishing a communication with Leeds and with the metropolis. The York and London committee also recognised that the Midland route to the north was at this time the only practicable plan. A general meeting of the inhabitants of York and its vicinity was held, on the 13th of October, 1835, in the Guildhall, when the York and North Midland Railway Company was formed with a capital of £200,000 in shares of £50 each. The subscribers to the York and Leeds Railway, it was announced, might take the same number of shares in the new company as they held in the old, and have the amount already paid as a deposit placed to their credit in the York and North Midland books.† The whole of the shares which it was decided to issue, namely, 3,000, were subscribed for during the course of the day. George Stephenson having been engaged as engineer, his assistant, Frederick Swanwick, met the Provisional Committee on the 28th of October and conferred with them on the subject of route. Two lines were submitted to them, one by Tadcaster and the other by Bolton Percy. They selected the latter and Mr. Swanwick was instructed to proceed at once with the survey.‡

A deputation from Doncaster, consisting of Messrs. E. Beckett Denison, R. Baxter and W. Alexander, having vainly attempted to induce them to take their line to that town and join the North Midland Railway at Mex-

* *Athenæum*, 18th April, 1835, p. 308.

† Minutes of York and North Midland Railway Company, 13th September, 1835.

‡ *Ibid.*, 14th and 28th October, 1835.

borough,* they finally approved of a line commencing, according to their Parliamentary notice, at Backhouses' Gardens, near Tanner Row, York, and after passing by Copmanthorpe and Bolton Percy, terminating at a point in the township of Altofts by a junction with the North Midland Railway. Seven short branches were intended to be made, one connecting the line with the west bank of the river Ouse, one with the Huddersfield and Leeds Railway, one with the North Midland Railway and four with the Leeds and Selby Railway.† The cost of the line, it was found, would considerably exceed £200,000 and it was decided on the 7th of December to increase the number of shares to 6,000.‡

While George Hudson and his colleagues, zealous for the prosperity of York, were striving to keep the great trunk line through the northern counties on the eastern side of the island, other groups of enterprising men were working towards the same end in the interests of the towns with which they were associated between York and Edinburgh. One of the first to come forward with a scheme for the promotion of a part of the great Northern Railway was Matthias Dunn, a well known colliery viewer who, in the spring of 1835, projected a line from Newcastle to Morpeth called the "Northumberland Railway," 16 miles in length, commencing on the east side of Ridley Place, Newcastle, and, after crossing Pandon Dene by a bridge, running past Haddrick's Mill, Killingworth Pit Houses, Burradon Pit, Seghill, Cramlington Colliery and Bedlington to the north bank of the Wansbeck near the Morpeth gas works. The line was to be connected with Blyth and North Shields by branches striking off near the junction of the Cramlington with the Morpeth and Shields roads.§

From the Tyne and Morpeth line at Newcastle, it was also proposed to form a railway to Durham, keeping in view a continuation of the line to Darlington.|| At a meeting held on the 23rd of May a provisional committee was appointed to further the object of the Northumberland Railway¶ and, six months later, they proceeded to apply for Parliamentary powers to construct a railway—not from Newcastle to Morpeth with a branch to North Shields, but from Morpeth to Shields with a branch from Shankhouse to Newcastle.** The scheme, however, hung fire.

* Minutes of York and North Midland Railway Company, 10th November, 1835.

† *Leeds Mercury*, 14th November, 1835.

‡ Minutes of York and North Midland Railway Company, 7th December, 1835.

§ *Prospectus of a Railway from Newcastle to Morpeth to be called the Northumberland Railway, ultimately to be connected by Branches with Blyth and Shields*, by Matthias Dunn, 1835.

|| *Tyne Mercury*, 21st April, 1835. ¶ *Ibid.*, 26th May, 1835. ** *Ibid.*, 17th November, 1835.

From Darlington—from the deeply-planning brain of Joseph Pease—emanated the Great North of England Railway,* which was projected in the latter part of October, 1835, soon after the formation of the North Midland and the York and North Midland Railway Companies, for the purpose of “connecting Leeds and York with Newcastle-upon-Tyne and forming a continuation of all the proposed lines from the metropolis towards Scotland.” A similar project had been started in London in September, but the shrewd gentlemen of Darlington thought that the undertaking would be managed much better by those who were connected with the agriculture and commerce of the district, having great practical experience, than by a company of strangers.† They saw that this “long-anxiously-expected means of communication” would increase the traffic of their own line by giving “a cheap and expeditious transit for coals into the heart of the North Riding and to the city of York itself.”‡ Consequently, “it was exceedingly desirable” as the shareholders of the local line were informed by a special minute “that those interested in the Stockton and Darlington Railway should be shareholders in the said undertaking.”§ The committee at Darlington were resolved that the connection between London and Edinburgh should be by York. The influential London committee of the North Midland Railway were anxious that this connection should be by way of Leeds, and conceived a plan of extending the North Midland Railway from that town to Newcastle and Edinburgh.|| Edward Baines, in the *Leeds Mercury*,¶ after showing that a larger sum of public benefit would be derived from a Leeds and Newcastle than from a York and Newcastle Railway, urged the trading, manufacturing and commercial classes of the town and district to meet the “crisis,” as he called it, with energy and public spirit. The Central Provisional Committee which had been formed, comprising nearly the whole of the directors of the Stockton and Darlington Railway Company and the chief promoters of the York and North Midland Railway, while determined that the railway should go to York, included in the scheme a branch to Leeds. A prospectus was issued towards the end of October in which the capital of the proposed company was stated to be one million. It was too late in the year to prepare plans of the whole line for the ensuing session of Parliament, but the engineer was directed to make a survey of the northern portion—between Newcastle and Croft Bridge which, according to his calculations, would take twelve

* *Tyne Mercury*, 3rd November, 1835; *Larchfield Diary*, 1876, p. 43.

† Report of Central Committee read at Newcastle, 6th April, 1836.

‡ Minutes of Stockton and Darlington Railway Company, 30th October, 1835.

Ibid.

|| *Yorkshireman*, 31st October, 1835.

¶ 7th November, 1835.



months longer to construct than the southern portion, and to deposit plans at the usual date. By obtaining powers to construct the northern portion in 1836 and the southern portion in 1837, it was thought that the entire line might be brought simultaneously into operation. Thus the scheme would be forwarded as much as if an Act had been obtained in 1836 for the whole line. The survey, begun at Pilmore House (now Rockcliffe), near Croft, on the 2nd of November, was completed in fourteen days* and the committee, forestalling the promoters of the York and Newcastle Railway who had opened a subscription list and announced the formation of a new company†—gave the usual Parliamentary notices and deposited their plans on the 30th.

The line adopted seems to have followed the course of one previously laid down by George Stephenson.‡ It commenced by a junction with the Blaydon and Hebburn Railway in a field called the Hassocks, near Redheugh Quay, and, running along the eastern side of the Team Valley, proceeded by way of Ouston B Pit—passing it on the west—to Low Flatts, near which it took a southward direction, running parallel with the Great North Road past Chester-le-Street and over Chester Dene, within a short distance of the Hermitage, to the east side of Newton Hall—nearly the same course, it will be observed, as the present Team Valley line—then passing Frankland on the east, it crossed the Wear by a bridge to Gilligate Moor and continued by way of Old Durham and Shincliffe to Thrislington Gap, going through the valley side by side with the Clarence Railway then, diverging to the westward, it proceeded over Mainsforth Carrs, past Great Chilton and Coldsides, down the Skerne valley near the Great North Road, past Aycliffe and Brafferton to the Stockton and Darlington Railway, then along the Croft branch for a mile and a half and afterwards nearly parallel with it to its termination at Hurworth Lane, a total distance of $34\frac{1}{2}$ miles. The line south of the Tees appears at first to have been intended, after crossing the Swale between Newsham and Thirsk, to proceed to the neighbourhood of Ripon, where it divided into two lines, one running due south by Boroughbridge, Knaresborough, Wetherby, Tadcaster and Aberford to Leeds, the other south-east, approaching Easingwold and following the course of the Ouse to York.§ The line, according to a subsequent plan, took a straight course to the York and North Midland Railway, leaving the city of York at a distance of three miles. This was

* MS. Report of Proceedings in Committee on Great North of England Railway Bill, 30th April, 1836.

† *Durham Advertiser*, 13th November, 1835; *Times*, 3rd November, 1835.

‡ Speech by Jos. Pease at Newcastle, 17th November, 1835.

§ *Leeds Mercury*, 7th November, 1835.

not a plan to commend itself to the committee which had been formed in the city to promote a railway from York to Newcastle "as a *continuation* of the York and North Midland Railway." They thought that the line, instead of bending to the westward, might go *viâ* Skelton and cross the Ouse by a bridge which would also serve for the lines projected from Whitby, Scarborough and Bridlington.* A deputation was sent to Darlington to urge that the line should pass or terminate near to the city of York. The Central Provisional Committee, while laying down the principle that a grand national line ought not to be materially diverted from a direct course to serve merely local or partial interests, admitted the importance of taking a line of railway to the city of York as the point where several great railways were likely to converge and expressed their desire to meet, as far as possible, the wishes of the inhabitants of York.† They announced, however, that it was not their intention to favour York by neglecting Leeds. As the result of conferences between the two committees, a line was selected which touched York at Thief Lane, near Micklegate Bar, and joined the York and North Midland Railway on Hob Moor. The promoters of the railway, while intending to lay down at first a double line, contemplated purchasing land for a quadruple line, realising with Joseph Pease that the time might come when goods would be carried at the rate of 30 miles an hour, and when passengers would not be content with travelling less than 60.‡

The Clarence Railway Company were much incensed when they found that Darlington and the Darlington Railway were to get the lion's share of benefit from the Great North of England Railway. Drawing a line due north from Thirsk, they ascertained that it would cross the Stockton and Darlington Railway about Fighting Cocks, $3\frac{1}{2}$ miles nearer Stockton than Croft Junction, and being continued northward, would fall into the Durham branch of the Clarence Railway which, in their opinion, might be adopted no less advantageously than the Croft Branch of their rivals. In Stockton the long smouldering distrust of Darlington broke out afresh. A public meeting was held on the 24th of December to consider how the interests of the town and district would be affected by the various projects then before the county—by the Great North of England Railway, as already described, by the Durham South-west Junction Railway (12 miles in length) connecting the Auckland and Coundon coal-fields with the Chilton branch of the Clarence Railway, and by the South Durham Railway (26 miles in length) connecting the lime-

* *Durham Advertiser*, 4th December, 1835.

† *Tyne Mercury*, 8th December, 1835.

‡ Speech at Newcastle, 17th November, 1835 [*Tyne Mercury*, 24th November, 1835].

stone district of Frosterley, the lead-mining town of Wolsingham and the Roddymoor, Bitchburn, Brandon and Willington coal districts, with the Byers Green Branch of the Clarence Railway, and the Wingate branch of the Hartlepool Railway. At this meeting the two rival companies confronted each other in the persons of Christopher Tennant and Joseph Pease, the one the originator of the Clarence Railway and the projector of the Durham South-west Junction Railway, the other the director of the policy of the Stockton and Darlington Railway Company and the promoter of the Great North of England Railway. The feeling of hostility was mutual. From the Stockton and Darlington point of view, the Clarence Railway Company were making "a *sinister* attempt to obtain the sanction of the Legislature to a branch railway calculated to injure their line by depriving it of traffic;"* from the Clarence point of view, the Stockton and Darlington Railway Company, in promoting the Great North of England Railway, were endeavouring "to get possession of the county."† The charges and imputations which were made by Christopher Tennant against his Darlington opponents were met and denied by Joseph Pease. The meeting then appointed a committee to inquire into the several projects and report upon them. Another passage of arms took place at Durham on the 14th of February, 1836, when Mr. Tennant, having declared that, by adopting the Clarence Railway between Mainsforth and Blackgate as part of the Great North of England line and taking it west of Sherburn, across the Wear near Finchale Abbey, east of Chester-le-Street and through the Team Valley, £300,000 might be saved to the Company, Mr. Pease proceeded to combat his statements, pointing out the superiority of the line selected.‡ All doubt with regard to the course of the railway was soon afterwards set at rest by the reports of three eminent engineers, Mr. Rastrick, Mr. Cubitt, and Mr. Giles, who had been called in to examine it. According to Mr. Rastrick, the line "did not appear susceptible of much improvement." Mr. Cubitt had no hesitation in stating his opinion that "it would be exceedingly difficult, if not impossible, to find a better line." Mr. Giles' opinion was equally favourable.§ Having this assurance of the eligibility of the line, the Central Committee felt that no good purpose could be served by delaying the progress of the measure. It was known that a survey had been made for a west coast line into Scotland with the concurrence of a

* Report of the Committee of the Stockton and Darlington Railway Company, 1835-6.

† Speech by Christopher Tennant at Stockton, *Durham Advertiser*, 1st January, 1836.

‡ *Durham Advertiser*, 15th January, 1836. § Reprint of report of meeting, 6th April, 1836.

nobleman of immense wealth,* and as it was understood that the Legislature would not sanction two lines, the loss of the session might prove fatal to their success.

While seeking powers to construct this line from the Tyne to the Tees (34½m) they did not fail to give prominence to the fact that it was but part of a larger scheme, comprising a line from Hurworth Lane to York (41¼m), a line from Woodend, near Thirsk, by way of Boroughbridge and Wetherby to Leeds (36m) having a tunnel 4¼ miles long upon it, and a junction branch to the York and North Midland Railway on Hob Moor (1m). To meet the wishes of the inhabitants of Durham, as expressed at a meeting held on the 9th of March, 1836, they included in the scheme a short branch from a point near Pelaw Wood House to the south side of Gilesgate near the Causeway Foot (¾m).

Two lines which, primarily intended to complete the communication between the western and eastern seas, were destined to contribute short links to the chain of communication between London and Edinburgh, also formed the subjects of bills introduced in the session of 1836—the Newcastle and North Shields Railway and the Brandling Junction Railway. The measure promoted by the Newcastle and North Shields Railway Company was the outcome of an agitation commenced in the autumn of 1833 to revive a project which had failed in 1831 owing to the rivalry of two distinct parties, each advocating a different line. In consequence of this agitation, W. E. Gillespie, directed by Joshua Richardson, had made a survey of the riverside line, beginning at the Skinner Burn and passing by short tunnels to the Stock Bridge and the Ropery Banks at the end of the New Road, then across the Ouseburn, by way of St. Peters, St. Anthonys and Carville to Union Street, North Shields and, by a tunnel under Tyne Street, to the Pow Burn Bridge, with a branch from Flatworth Mill, past the east end of Rosella Place and the north side of the Poor House in Preston Lane, to Tynemouth, terminating opposite to the old Star and Garter Inn—now a dwelling-house, No. 7, Front Street. Robert Nicholson, assisted by John Bourne, had also made a survey of a line, laid down by John Straker, of Cramlington, commencing near the Shield Field and running direct to Byker Hill through which it passed by means of a tunnel 1,600 yards long, pursuing its course eastward by Old Walker, Stote's Houses, and Wallsend Church Pit, to Saville Street, North Shields, with a branch at the east end from the Union Mill near the Ouse-

* *Durham Advertiser*, 4th March, 1836.

burn to the Royal Jubilee School on the New Road and, at the west end, from Percy Main to a proposed dock at the Coble Dene.

As it was obviously impossible that two lines of railway could be remunerative in a district where one only was necessary—even if the Legislature could be induced to sanction them—the promoters of the rival schemes had come to the following arrangement:—To submit the question of route to the independent judgment of Benjamin Thompson and to abide by his decision. Mr. Thompson, having reported in favour of Mr. Straker's line, that line—with a deviation at the western end, suggested by Mr. Straker himself, for avoiding the tunnel through Byker Hill, and a change in the termination of one of the branches—from Coble Dene to the Steam Ferry at North Shields—had been approved of at a meeting held in Newcastle on the 4th of August, 1835, and finally adopted on the 7th of October.* The branch to Tynemouth had been abandoned on the 8th of February, 1836, the shareholders deciding to continue the main line to that place.†

The Brandling Junction Railway Company had come to Parliament for an Act of Incorporation to give them the usual powers for the levying of tolls, etc. After the transfer of the Messrs. Brandling's rights and powers under their Act to the Company on the 14th of September, 1835, the scope of the undertaking had been enlarged by an agreement with the Newcastle and Carlisle Railway Company (authorised to be made at a meeting held on the 19th of February, 1836), whereby, in consideration of the sum of £9,000 to be paid to the Newcastle and Carlisle Company and the fulfilment of certain engagements, they secured the abandonment of a competing line of railway and obtained the assignment of a beneficial contract for the supply of iron rails, the engagements being: to form a line of railway eastward from the point where the Newcastle and Carlisle Railway Company intended crossing the Tyne or any other point which might be agreed upon between the two companies; to re-lay the old waggonway to Tanfield Lea Colliery and convey the Marquis of Bute's coal to Jarrow, compensating him for any loss sustained by the non-completion of the branch at the date fixed, to execute the Blaydon and Hebburn line to Jarrow and to form shipping places there.‡

How sections of these two lines came to be a part of the East Coast route will be shown in a subsequent chapter.

* *Tyne Mercury*, 25th February, 1834: Case of the Promoters of the Newcastle and North Shields Railway Bill, 1836.

† Minutes of Newcastle and North Shields Railway Company.

‡ *Reply of the directors of the Brandling Junction Railway*, 1843.

Up to this time the only line projected north of the Tyne designed to form part of the great trunk line was the "Northumberland Railway," but, on the 31st March, 1836, there was issued the prospectus of the "Edinburgh, Haddington and Dunbar Railway," "forming an important link in the proposed prolongation to Edinburgh and Glasgow, of the great English railways from London by York to Newcastle-upon-Tyne" and, on the 2nd of April, a meeting was held in Edinburgh in support of it.* Seven days later a circular was issued by Stephen Reed, of Newcastle, inviting subscriptions for the survey of a "Tyne and Edinburgh Railway" which it was proposed should leave the Newcastle and Carlisle Railway at Warden and proceed up the valleys of the North Tyne and Rede to Whitelee, passing through the Carter Fell by a tunnel to Edgerston, and thence proceeding by Jedburgh to Galashiels and by the Gala Water to Edinburgh, with a branch to Glasgow.

The great scheme for carrying the line of communication from Birmingham to Newcastle was embodied in five bills which came up for the consideration of Parliament in the memorable session of 1836, namely, the Midland Counties, the Birmingham and Derby Junction, the North Midland, the York and North Midland and the Great North of England Railway bills. Bills for five other railways that would bring the two last sections of the grand northern trunk into connection with several large seaport towns and coal-fields were also comprised in the railway register of this session: these railways were the Hull and Selby, the Newcastle and North Shields, the Brandling Junction, the South Durham and the Durham South-West Junction. Deputations of railway directors journeyed up to London to promote the progress of their respective bills either by making arrangements with opponents or contesting their claims in committee.

Arrayed against the York and North Midland Railway were: Sir John Ramsden, Bart., Lord Howden and Thomas Boyes, the proprietors of the Aire and Calder Navigation and the Leeds and Selby Railway Company. The ground of opposition of the Leeds and Selby Company was that the York and North Midland Railway, in conjunction with the North Midland Railway, would compete with their own line for the trade between Leeds and Selby, and that two of the branches by which the York and North Midland Railway was to communicate with the Leeds and Selby Railway, instead of joining this line at the nearest point, ran parallel with it eastward for two miles and

* Prospectus of Edinburgh, Haddington and Dunbar Railway.

a half, depriving it of the tonnage on goods for that distance.* With all these parties the London deputation were able to make satisfactory arrangements so that before the Bill was reported, the opposition had ceased for want of opponents. The arrangements in two cases, however, involved the making of another application to Parliament. The cause of the extension of the branches by the York and North Midland Company had been the way in which the Leeds and Selby Company were allowed by their Act to take tolls for passengers.† Had the branches touched the older line at a point, say, 6 miles from Selby, the proprietors of the line could have charged 1s., = 2d. per mile, but, by touching it at a point 5 miles from Selby, they could only charge 6d., = 1½d. per mile. The Leeds and Selby Company, by agreeing to charge rateably according to the distance, rendered the prolongation of the loop-lines unnecessary and the York and North Midland Company, on their side, consented to alter their plan.

The arrangement with Lord Howden was that, provided the Act should be obtained for the line as intended, the Company should pay to him, six months afterwards, the sum of £5,000, and that they should endeavour to procure in the ensuing session another Act, authorising the deviation of the line in accordance with a plan agreed upon. The sum of £5,000 was demanded as compensation for damage which Lord Howden's estate would sustain from the railway passing through it, the land having still to be paid for at the rate of £100 per acre.‡

The Great North of England Railway Bill was opposed by Thomas Cookson, of the Hermitage, by Henry John Spearman—the tenant of Newton Hall—and by Lord Ravensworth, on the ground that the railway would interfere with the privacy of their mansions. It was also opposed on other grounds by Bryan John Salvin, of Burn Hall, by Sir Charles Hardinge, of Ketton, and the Marquis of Londonderry. The objections of five of the petitioners against the Bill were met at an early stage. Mr. Cookson, who had distributed two lithographic views showing an idyllic picture from his windows and the effect of a railway embankment in destroying it, did not withdraw his opposition until the Company had consented to purchase the whole of the Hermitage estate. Christopher Tennant and the Stockton objectors fought hard against the Bill. They deposited a plan showing an alternative line passing nearer to Stockton than Mr. Storey's—the portion

* Case of the Leeds and Selby Railway Company : Petitioners against the York and North Midland Railway Bill, 1836.

† Half-yearly Report to York and North Midland Railway Company, 27th January, 1837.

‡ *Railway Times*, 1839, p. 481.

from Redheugh to Thrislington surveyed by Mr. T. O. Blackett, and that from Thrislington to Nesham by Mr. D. Turner. It passed Durham at some distance on the east, a circumstance which was advanced in its favour. Like the Provost and Fellows of Eton College who had petitioned against the Great Western Railway Bill of 1834,* the counsel of the Opposition considered that a railway in proximity to a college would be detrimental to the morals of the students. The railway, it had been stated, would encourage the establishment of manufactories in Durham and these, he declared, would improve neither the health nor the morals of the young gentlemen who would, perhaps, be studying cotton more than the classics.† The Opposition impugned the accuracy of Mr. Storey's calculations and ridiculed the idea that the estimates for a railway which was to cost more than a million of money should be founded on a survey made in the short period of a fortnight. Unfortunately for the case of the Opposition, a serious error was found in the section of their own line. Mr. Thomas Sopwith, one of the surveyors for the Company, was sent down to the north by the mail to get the correct levels. Arriving at 2 a.m., he accomplished his task between 10 a.m. and 4 p.m. and travelled post-haste back to Westminster where, on the 2nd of May, he gave "strong evidence on the manifest intention of the 'erroneous section' to deceive the committee,"‡ thus completing the discomfiture of the opponents of the Bill.

The Newcastle and North Shields Railway Company having agreed to the insertion in their Bill of a clause proposed by the Duke of Northumberland, prohibiting them from carrying coals along the railway for the purpose of shipment without the consent of the adjoining landowners, looked for no opposition, but the inhabitants of North Shields and neighbourhood, complaining that the clause would deprive them of the full benefit of the railway, should docks and shipping places be constructed at North Shields, petitioned against the Bill. Lord Shaftesbury, the Chairman of committees, objected to the clause, and it was struck out.

The Company, thereupon, introduced a second clause, suggested by the Duke of Northumberland and designed, like the first, to prevent the diversion of traffic from the waggonways in which he was interested. It provided that the landowners should participate in the tolls, though giving no con-

* Northcroft's *Parliamentary Chronicle*, 1834, vol. ii. p. 400.

† MS. Report of Proceedings in Committee on the Great North of England Railway Bill, 30th April, 1836.

‡ Report of Proceedings in Committee on the Great North of England Railway Bill, 1836: *Life of Thomas Sopwith*, 1891, p. 108.

sideration for the benefit. They were to have 1d. per ton per mile on all coals for shipment for the distance over which these coals might be conveyed through their lands. The Committee rejected this clause, but passed another—the result of negotiations between the promoters of the Bill, the Duke of Northumberland and the North Shields petitioners—apportioning, out of the tolls on coals for shipment, $\frac{3}{4}$ d. per ton per mile to the adjoining landowners.* There was no opposition to the Bill as it passed through the House of Lords.

When the Hull and Selby Railway Company in November, 1834, gave notice of their intention to apply to Parliament for an Act, they were undecided whether to take the line from Hull by way of Hessle or by way of Cottingham, passing through Wauldby Hill by a tunnel. On the recommendation of Mr. U. A. Rastrick, to whom the matter was referred,† they had adopted the line by Hessle. This line passed for three quarters of a mile through the estate of Robert Raikes, of Welton, who complained that it would be “a very great nuisance and eye-sore” to it, “wholly and for ever destroying all its present advantages of scenery and rural and picturesque privacy, and thereby necessarily deteriorating its value to an incalculable extent, without one compensating or redeeming advantage” to himself.‡ In opposing the Bill, he represented that a different and shorter line (as pointed out by Mr. Giles) might have been adopted, which would either have avoided his estate or passed through remote parts of it. Failing to damage the Bill in the Commons, Mr. Raikes pursued it into the House of Lords, where other obstacles were thrown in its way. Among these was the question of the foreshore at Hull which the Corporation claimed should be reserved to them for all purposes whatsoever, the Company contending that they were entitled to convenient access to the river.§ Having come to a satisfactory understanding with the Corporation and bought off Mr. Raikes, the directors in charge of the Bill found themselves at the end of their difficulties.

The Durham South-West Junction and South Durham Railway Bills were opposed, not only by the dissenting landowners, but by the associated coalowners of the Tyne, Wear and Tees, headed by Lord Londonderry, on the ground that the Legislature, by relieving the Railway Companies from the payment of wayleave rents, would enable them to carry, more cheaply than they otherwise could have done, the coals of their rivals in trade. They

* Minutes of Newcastle and North Shields Railway Company, January 23rd, March 19th and 26th, and April 2nd, 1836; *Tyne Mercury* 3rd May, 1836.

† *Leeds Mercury*, 22nd November, 1834.

‡ Petition of Robert Raikes against the Hull and Selby Railway Bill, 1836.

§ Half-yearly Report, 31st August, 1836.

objected, in fact, to these railways being formed under more favourable conditions than their own waggonways, and petitioned that the land required for the purpose might not be taken without the consent of the owners, or, if compulsory powers were granted, that the value of the land might be estimated with reference to the advantages which, according to the custom of the country,* would probably have accrued from wayleaves. To defray the expenses of this opposition they formed a special fund to which the lessors of coal-mines and wayleaves also contributed.† The proceedings of the coal-owners and the menace of their joint purse and influence brought the Corporation of London forward with a petition in which it was suggested that the members for Middlesex, Surrey, Essex and Kent and the cities and boroughs within these counties should be added to the committee then sitting on the two Bills, but the House was unwilling to take a step reflecting, as it would have done, on the characters of the members already appointed.‡

In petitions from the County of Middlesex and from Westminster, the coalowners were charged with limiting the supply of coals to the London market for the purpose of maintaining prices, and it was stated that their opposition to the two Bills was part and parcel of a general plan devised by them for excluding competition.§ These allegations, the House of Commons thought fit, on the 1st of June, to refer to a select committee, meeting the wishes, not only of the petitioners, but of the coalowners themselves who had already announced, by a resolution passed on the 30th of April, that they would welcome a parliamentary inquiry into the state of the coal trade.

The Durham South-West Junction Bill, having for its object the extension of the Clarence Railway into the Auckland district, met with the most determined opposition from the Stockton and Darlington Railway Company, who had the advantage of being represented on the committee by the member for South Durham. There were wheels within wheels. In addition to being connected with the Clarence Railway Company, some of the promoters of the Durham South-West Junction Railway were the founders of the Durham County Coal Company who had just purchased the Gordon and Evenwood Collieries adjoining the Hagger Leases branch. It was certain that, if the proposed railway was made, the traffic from these collieries would be diverted from the Stockton and Darlington line at West Auckland. A militant spirit was aroused in the Quaker Board. In attacking the obnoxious

* *Report on the State of the Coal Trade*, 1836, p. 19.

† *Minutes of Evidence on South Durham Railway Bill*, 1st June, 1836, p. 10.

‡ *Tyne Mercury*, 12th May, 1836.

§ *Report on the Coal Trade*, 1836, app. 207.

Bill the course they took was to concentrate attention on the financial difficulties of the Clarence Railway Company: to show that the projection of this line was "an attempt to bolster up a ruinous speculation at their expense."* Question after question was asked with this end in view. Facts which the Clarence Railway Company would gladly have withheld from public knowledge were mercilessly dragged into the light, revealing a very unfortunate state of affairs. The Marquis of Londonderry—an old opponent of the Clarence Railway—asking in the House of Lords whether the Exchequer Loan Commissioners had any chance of recovering the money advanced for that undertaking, threatened to bring "this iniquitous job forward to public exposure."† Thus opposed, it was not surprising that the preamble of the Durham South-West Junction Railway Bill was declared to be "not proved."

The case for the South Durham Railway was a strong one. It would open out an extensive coal-field, connect Weardale with Hartlepool and Stockton, and put new life into the Hartlepool and Clarence Railway Companies. It was well supported, among the subscribers being men of repute like George H. Wilkinson, of Harperley Park, Cuthbert Rippon, of Stanhope Castle, William Russell, of Brancepeth Castle, Joseph Wooler, of Wolsingham, Charles Barrett, of Cockerton, John Charles Ord, of Nunthorpe, and George Hudson, of York. Opposed by the Dean and Chapter of Durham, the Marquis of Londonderry and the coalowners, the Bill remained victorious in five contested divisions in committee on the 15th of June‡ and, on the 29th, passed the House of Commons by a large majority. The Stockton and Darlington Railway Company professed to be friendly to the measure, but there can be little doubt that they did not view with equanimity the presence of another company in a district to which they had proposed extending their own line as early as August, 1822. At any rate, they dissembled their love very well, for not only did Joseph and Henry Pease attend, and take part in, the meeting of the Coal Trade Committee at which funds were voted to oppose the Bill but, on the 7th of July, when there was a reasonable prospect of the Bill being ultimately successful, Mr. Storey received instructions to make a survey for a line from the south foot of the Black Boy Bank to Crook, to the very centre of the coal-field proposed to be tapped by the South Durham Railway. The line was to have this advantage, that locomotive engines would be able to travel along it from end to end, whereas on the South Durham Railway stationary engines would be required at Elm

* Report of Directors, Stockton and Darlington Railway, Y.E. 30th June, 1836.

† *Tyne Mercury*, 10th May, 1836.

‡ *Durham Advertiser*, 17th June, 1836.

Park, Dowfold Hill, Byers Green, Spennymoor, and Wingate. The opponents of the South Durham Bill in the House of Lords, afraid to let its merits be discussed before a committee, made up a party to defeat it on the second reading and, on the 11th of July, it was rejected by a majority of 32, 19 of the Lords, among whom were all the ministers in the House, voting for it, and 32 against it.

Among the 30 Acts for the construction of new railways which received the Royal Assent during this memorable session, 5 were for railways in the north-eastern part of England. The total length of line authorised to be made by these 30 Acts was 1,011 miles, and the total capital sanctioned by them $23\frac{1}{2}$ millions, of which $120\frac{1}{2}$ miles of line and $2\frac{1}{2}$ millions of capital belonged to the aforesaid 5 railways as shown in the following statement:—

Name of Railway.	Act.		Length of Line.	Capital intended to be raised in Shares or by Loan.
	Description.	Date of Royal Assent.		
Brandling Junction Railway	6 and 7 Wm. IV. c. 57	7 June, 1836	Miles. $16\frac{3}{4}$	£ 146,000
Newcastle and North Shields Railway	„ „ 76	21 June, 1836	7	160,000
Hull and Selby Railway ...	„ „ 80	21 June, 1836	$30\frac{3}{4}$	533,333
York and North Midland Railway	„ „ 81	21 June, 1836	$31\frac{1}{2}$	493,333
Great North of England Railway	„ „ 105	4 July, 1836	$34\frac{1}{2}$	1,150,000*
			$120\frac{1}{2}$	2,482,666

The toll clauses of these Acts presented many variations. The York and North Midland and Hull and Selby Railway Companies had adopted a four-fold classification of goods and minerals, the other three companies, a five-fold one. The tolls of the Hull and Selby and Leeds and Selby Railways—which completed one line of communication—and of the Brandling Junction and Newcastle and Carlisle Railways—which completed another—were, in the case of goods and minerals, exactly alike, but the tolls of the York and North Midland and Great North of England Railways—sections of a third line of communication—differed considerably. While the York and North Midland Company had power to levy $1\frac{1}{2}$ d. per ton per mile on all coals, building stone, bricks, lead and pig-iron and $2\frac{1}{2}$ d. per ton per mile on all manufactured goods passing along

* While only a portion of the line was authorised to be made, the capital sanctioned represents the estimated expenditure on the whole line from Newcastle to York as well as on the Thirsk and Hob Moor branches.

their line, the Great North of England Railway Company might demand in the one case 2d., and in the other 3d. The tolls in these Acts, for the use of the railway by carriages conveying passengers was, in the Hull and Selby, Newcastle and North Shields and Brandling Junction Railway Acts, 2d. per mile for each person; in the York and North Midland Act 2½d., and in the Great North of England Act 3d.

The first directors of the Brandling Junction, Great North of England and Hull and Selby Railways were appointed by these Acts until the first general meetings.* In the case of the first-named railway, Mr. Robert William Brandling was authorised to act as managing director with power to appoint or remove the engineers, surveyors and inspectors subject to the approval of the other directors. Within little more than a month, the five Boards were elected,† the first general meeting of the Brandling Junction Railway Company having been held on the 5th of July, of the Newcastle and North Shields Railway Company on the 12th, of the Great North of England and York and North Midland Railway Companies on the 10th of August, and of the Hull and Selby Railway Company on the 31st of August.

* *Brandling Junction Railway*.—Robert William Brandling, John Carr, Thomas Emerson Headlam, Michael Longridge, William Losh, William Mountain, William Peareth, Thomas Pemberton, Ralph Naters, William Spencer, John Walker, Andrew White, John William Williamson.

Hull and Selby Railway.—Henry Broadley, George Cookman, Robert Martin Craven, Edward Gibson, John Gott, John Gresham, James Henwood, George Liddell, James Garth Marshall, Robert Robinson Pease, Richard Richmond, Avison Terry, Richard Tottie.

† *Brandling Junction Railway*.—James Kirkley, Anthony Nichol and John Pemberton were elected in the place of William Peareth, Thomas Pemberton and Andrew White who had been appointed by the Act.

First Chairman : John Pemberton.

Newcastle and North Shields Railway.—Christian Allhusen, Thomas Barnes, Matthew Bell, M.P., John Crawford, George Cruddas, Nathaniel Grace, Joseph Grote, John Hodgson, Thomas Hodgson, Matthew Hudson, John Jobling, Mark Lambert, John Potts, Thomas Ramsey, Richard Spoor.

First Chairman : Matthew Bell, M.P.

Joseph Grote declined to act and, on the 23rd, James Lownds was elected in his stead.

Great North of England Railway.—John Charles Backhouse, Robert Botcherby, Thomas Cargill, John Mellar Chapman, Charles Heneage Elsley, John Flintoff, William Losh, Thomas Meynell, jun., Edward Oxley, Henry Pease, Jonathan Priestman, William Shields, Henry Pascoe Smith, Josiah Smithson, Henry Stobart, George Wall, George Hutton Wilkinson.

First Chairman : George Hutton Wilkinson.

York and North Midland Railway.—Thomas Backhouse, Thomas Barstow, William Cooper, Robert Davies, George Dodsworth, John Hotham, George Hudson, James Meek, Richard Nicholson, James Richardson, Sir John Simpson, James Walker.

First Chairman : George Hudson.

Hull and Selby Railway.—William Spyvee Cooper, Samuel Lightfoot, John Cowham Parker, Joseph Robinson Pim and Charles Whitaker were elected at this meeting, four in addition to those appointed by the Act, one in place of John Gott who had retired.

First Chairman : Henry Broadley.

While these companies were preparing to carry into effect their respective measures, other groups of promoters were soliciting support for schemes to complete and extend the Great North line. Early in July, some of the directors of the Stockton and Darlington Railway, in conjunction with the inhabitants of Richmond, revived a project which had been discussed as early as April, 1825, and a company was formed with a capital of £50,000 to make a railway from Citta Dilla, near Richmond, to Croft for the purpose of connecting Richmond, Swaledale and Wensleydale with Cleveland and the Great North of England Railway.*

On the very day that the Royal Assent was given to the Great North of England Railway Bill, three men of note in Newcastle—Matthias Dunn, Robert Hawthorn and John Dobson—drew up the prospectus of a railway which was intended to continue the line of communication northward, from the Tyne to Dunbar. This railway, which it was proposed to call the "Grand Eastern Union Railway," commenced in the neighbourhood of the Forth in Newcastle, proceeded by way of Leazes Terrace and Claremont Place to the north of Jesmond High Terrace, then ran parallel with the Great North Road—on the west side of it—to Fisher Lane end, and passing between Downhill and Shotton, continued in a direct line past Netherton, within a short distance of Morpeth and Warkworth, near Lesbury, between Alnwick and Howick to Berwick, crossing the Tweed by a high level bridge, afterwards pursuing a course past South Ayton, East and West Reston and Grant's House to Dunbar, a total distance of 88 miles. Resolutions in favour of the line were passed at Berwick on the 19th of July and committees formed in Newcastle and Berwick to promote the scheme.

There were now two rival routes from the Tyne to Edinburgh, one by Hexham and the Carter Fell, the other by Berwick and Dunbar—which was to have the preference? In the opinion of George Stephenson, who had shaped, either directly or indirectly, the whole course of the great trunk railway from London to the Tyne, "no other line could be found equal to the one on the Eastern coast." The line by the Carter Fell, he pronounced to be totally impracticable.† The promoters, however, by no means inclined to defer to his authority, criticised his report with some acerbity, and continued to advocate the claims of their own line, which they altered consider-

* Prospectus of Richmond and Cleveland Railway, 1836; *Durham Advertiser*, 8th July, 1836; *Tyne Mercury*, 12th July, 1836.

† Report to the directors of the Edinburgh and Dunbar Railway Company, dated 20th August, 1836, embodied in Report on a Railway from Newcastle to Edinburgh, 1838, p. 15.

ably, taking it from the Town Moor, Newcastle, by way of Stamfordham to Redesdale instead of adopting the Newcastle and Carlisle Railway to Warden, and from Jedburgh by way of Peebles and Pennycuik to Edinburgh instead of by way of Galashiels and Crichton Moss, branches being thrown out to Glasgow, Hawick, Selkirk and Kelso.* A suggestion having been made by the sub-committee of the Border Association for the encouragement of Agriculture that the works of the Berwick and Kelso Railway, which had been postponed for a quarter of a century, should at last be executed, a meeting of the proprietors was actually held on the 5th of October, 1836, to consider the question,† but the Company was already moribund and, after this flash of vitality, a deadly torpor supervened, lasting until its dissolution a year and three months later.‡

The chain of communication between London and Edinburgh, as laid down on the plans of six independent companies, was now complete, with the exception of one short link between Gateshead and Newcastle. Opinions differed as to the best mode of crossing the river and reaching the summit level for the continuation of the railway into Scotland. One party favoured a low level bridge, another a high level bridge. Among the former was Richard Grainger, the reconstructor of central Newcastle, who had a scheme for the industrial development of Low Elswick. He came forward with a plan to concentrate the termini of the various railways approaching Newcastle in a large joint station, the site of which—now partly occupied by the Elswick Leather Works—may be described as lying between Dunn Street and Water Street on the one hand, and between Scotswood Road and Skinner Burn Road on the other.

According to this plan the lines of the Newcastle and Carlisle, Great North of England and Brandling Junction Railways would converge to a point about midway between the Team Gut and Redheugh Hall (the east end of the present Dunston Staiths) and cross the river at an elevation of 20 feet above high water mark. The great north line would then be carried up the hillside to the north of the West Road, past the end of Elswick Row, and the Newcastle and Carlisle Railway continued to the Spital on inclined planes worked by stationary engines. A line would also be made along the riverside under the powers of the first Newcastle and Carlisle Railway Act to the Skinner Burn and thence by arrangement with the owners

* *Second General Report of the Newcastle-upon-Tyne, Edinburgh and Glasgow Railway*, by Jonathan Richardson, 1837.

† *Tyne Mercury*, 6th September, 1836.

‡ *Ibid.*, 6th February, 1838.

of property in the Close to the Quayside east of the Tyne Bridge, where it was intended to be joined by a branch from the Newcastle and North Shields Railway. Mr. Grainger proposed to construct the bridge and erect the joint station, letting or selling them, when required, to the companies using the same.*

To this plan was opposed that of a high level bridge recommended by Thomas Storey. He proposed to cross the river at an elevation of 74 feet above high water mark, either on the Parliamentary line of the Great North of England Railway or to the east of Redheugh and proceed behind Blenheim Street across Westgate Road to Bath Lane and then, either by a tunnel 1,000 yards in length under Leazes Terrace, or outside the town walls to Gallowgate and through the gardens at the back of Percy Street to the east of the Town Moor, with short branches from Shot Factory Lane to the Newcastle and Carlisle Station at the Spital and from Jesmond High Terrace to the Newcastle and North Shields Railway near the Ouseburn. The bridge was to be constructed to carry the Newcastle and Carlisle Railway across at a lower level.† In a subsequent examination of the banks of the river, Mr. Storey found that a more favourable site for the bridge might be obtained to the eastward of the Parliamentary line, and that this point might be gained by a deviation commencing about 3 miles south of the Tyne and exceeding the statutory limits by nearly 2 miles.‡ This change of plan, while it alienated the Newcastle and Carlisle Company—who were desirous of holding the key to the approach of Newcastle—brought together the Great North of England and Brandling Junction Companies. A meeting of the engineers of the companies interested in the bridge was called for the 31st of August to consider the question.§ To this meeting, however, the Newcastle and Carlisle Railway Company declined to send their engineer, stating that they had decided to proceed with the construction of their bridge and the line to the Spital in pursuance of their Parliamentary powers.|| The engineers who attended—George Stephenson, Nicholas Wood and Thomas Storey—expressed their opinion that the interests of all parties as well as of the public would be best promoted by a concentration of the several railway companies on the south side of the

* *A proposal for concentrating the termini of the several Railways near Newcastle and providing depots with convenient access to the town*, by Richard Grainger, 1836.

† Thos. Storey's *Report to the Great North of England Railway Company*, 23rd July, 1836.

‡ Minutes of Great North of England Railway Company, 18th August, 1836.

§ Minutes of Great North of England Railway Company, 26th August, 1836.

|| Thos. Storey's *Report to the directors of the Great North of England Railway*, dated 1st September, 1836.

Tyne opposite to the Forth Banks or Shot Factory Lane at a level of about 75 feet above high water mark and communicating with the depôt in the Spital by a bridge across the Tyne at that level.*

Shortly afterwards, Mr. T. E. Harrison, the engineer of the Stanhope and Tyne and Durham Junction Railways, who had already conceived the idea of linking up some of the existing railways in the county of Durham to form a new northern line, submitted a plan for crossing the Tyne at Bill quay.†

A high level communication between Newcastle and Gateshead for carriages and foot passengers as well as for railways was now generally recognised as inevitable, and a company had already been projected with a capital of £125,000 for the purpose of forming the Great North Road Suspension Bridge, as designed by Robert Dodd of Newcastle.‡ After obtaining from Mr. Grainger the terms on which he would build a low level bridge and dispose of land for the station, and instructing Mr. Green to make plans and estimates for a high level bridge, the Great North of England Board turned their attention to the question of continuing the railway from the Tees to York.

The line adopted for this extension commenced at the road leading from Croft Bridge to Hurworth and, after crossing the Tees at an elevation of 49 feet, nearly half a mile from the old bridge, and curving slightly to the south-east, followed an unswerving course on the west side of the Great North Road (from which it was never more than two miles distant) to the York and North Midland Railway on Hob Moor, passing near to North-allerton, Thirsk, Raskelf and Shipton and crossing the Ouse near Nether Poppleton at an elevation of 30 feet 1 inch, a total length of 41 miles 47 chains.§ It passed through a rich agricultural district, sufficiently far from the coast to be unaffected by the shipborne traffic and having no competition to fear from any existing railway, canal or navigable river. From this line there were two branches, one to the city of York (68 chains) and the other to Thirsk (1 mile 10 chains). Most of the landowners were favourable to the line, but Lord Downe objected to it passing through his Beningbrough estate in the direction laid down by the engineer, and suggested that it should be carried about a mile further eastward. To meet his wishes,

* Joint Report of the Engineers, 31st August, 1836.

† A. J. F. Marreco to T. E. Harrison, 21st September, 1836. The same point for crossing the Tyne was suggested by a writer in the *Railway Magazine*, December, 1837, p. 409.

‡ *Tyne Mercury*, 14th June, 1836.

§ Whishaw's *Analysis of Railways*, 1837, pp. 88-90.

a survey was ordered for a line in this direction and also for a line diverging from Woodend in the direction of Tadcaster.* Alarmed at the mere possibility of a change of route, the York and North Midland Board sent a deputation to Darlington to remonstrate with the Great North of England Board and to state that they would oppose strenuously any line which would not join the York and North Midland Railway at York.† The Great North of England Board had no wish to deviate from their original line and readily gave an undertaking to adhere to it provided the York and North Midland directors could overcome the objections of Lord Downe. The engineer, fortunately, was able to make some improvement in the course of the original line and the threatened opposition fell to the ground. The plan of crossing the Ouse at Poppleton met with some opposition in York, the Ouse Navigation Trustees and the Merchants' Company petitioning against the Bill on the ground that, at such a distance from the city, the bridge would not be available for the projected Scarborough line, and therefore that a double, instead of a single, obstruction to navigation would be placed in the way of the sloops and other vessels connected with Boroughbridge and Ripon,‡ but on protecting clauses being inserted in the Bill this opposition, also, was withdrawn.

To establish a communication with the Great North of England Railway was now the aim of the older railway companies as well as of the projectors of new lines in its vicinity. The Durham and Sunderland Railway Company intended to apply for power to abandon that part of their main line extending from Broomside to Gilesgate, Durham, and to substitute for it another line from Broomside, by way of Shincliffe, across the Wear to Hallgarth Street at the head of Old Elvet but, failing to obtain from the Bishop of Chester—one of the prebendaries of Durham—a right of way through his land at Old Elvet, they were obliged to modify their scheme. Their amended plan was for a deviation of the main line from Broomside to the Wear and two new branches, one from Sherburn Hospital to Whitwell and Quarrington, the other from the west side of the Wear to Brandon and Langley, the deviation being 3 miles 25 chains in length, the branches 5 miles 27 chains. The Durham Junction Railway Company also projected a Durham branch, from Chilton Moor by way of Leamside to the north of Gilesgate, nearly 5 miles in length, but subsequently dropped it, applying only for power to make a branch from

* Minutes of the Great North of England Railway Company, 23rd September, 1836.

† Minutes of the York and North Midland Railway Company, 6th October, 1836.

‡ *Tyne Mercury*, 28th March, 1837.

Elba to Houghton-le-Spring, 1 mile 56 chains in length. Parliamentary notices were also given by the promoters of the Richmond and Cleveland Railway for a line from Citta Dilla to Croft; by the Clarence Railway Company for a branch from the Chilton branch to Pollard's lands in Bishop Auckland; and by the West Durham Railway Company (the old Durham South-west Junction Railway Company) for a line from the end of the Chilton branch running south of Crawleas by way of Close House and South Church and, after uniting with another line running north of Crawleas, through Coundon, continuing to St. Helen's Auckland, with branches to the Hagger Leases branch of the Stockton and Darlington Railway and to Bishop Auckland.

The more active promoters of the South Durham Railway revived that scheme in a modified form, depositing plans for a wayleave line from Frosterley to the Byers Green branch of the Clarence Railway, with three short branches, to be called the Weardale Junction or New South Durham Railway. By dropping the Wingate branch, which passed through the Kelloe estate of Lord Londonderry, they made it impossible for that nobleman to oppose them on personal grounds, but they limited at the same time the scope of their undertaking, allowing it to become a mere dependency of the Clarence Railway.

The people of Hartlepool were not disposed to sit still and see the mineral wealth of West Durham carried down for shipment exclusively to Port Clarence. Parties connected with the dock and railway promoted the "Great North of England, Clarence and Hartlepool Junction Railway," which was only the Wingate branch of the South Durham Railway under a longer name, and they applied for a permissive Act to enable them to make a line 8 miles 34 chains in length from the Wingate branch of the Hartlepool Railway to the Byers Green branch of the Clarence Railway, with two branches to the Great North of England Railway, together 1 mile 32 chains in length. As a counterpoise to this railway, Christopher Tennant projected the Clarence and Hartlepool Union Railway, afterwards known as the Stockton and Hartlepool Railway, which would enable coals passing down the Clarence Railway to be shipped at Hartlepool as well as Port Clarence. This line was 7 miles 75½ chains in length, extending from Billingham to the Tide Harbour bank at Hartlepool, with a branch 1 mile 22 chains in length, to Seaton Carew. Both the Clarence and Hartlepool Companies, however, had to reckon with what Mr. G. H. Wilkinson called

the "amicable rivalry" of the Stockton and Darlington Railway Company,* under whose auspices was projected the Bishop Auckland and Weardale Railway. The original intention was to make a line from the south foot of the Black Boy Bank to Frosterley (16 miles and 24 chains in length), passing through a ridge underneath the Black Boy branch by a tunnel 61 chains long and 23 feet 9 inches in height, and running by way of Holdforth, South Church, Escomb, across the Wear near Holme, then first on the north side of the river and afterwards on the south side to its terminus, with two branches, one to Crook, 3 miles 16 chains in length, and another to Bishopley, 1 mile 13 chains in length, but it was ascertained that if an attempt were made in the session of 1837 to obtain powers for carrying the railway westward of the coal district at Witton and Crook, a determined opposition to the scheme would be made in Parliament by the Countess of Coventry and Mr. Thomas Bowes, who had respectively land at Thornley and Bradley. It was decided to abandon the part of the main line from Witton to Frosterley and the branch to Bishopley and undertake the extension of the railway to the limestone district at a later period.† With the fear of the Coal Trade Association before them, the promoters of all these mineral lines applied only for permissive Acts.

In the state of the money market at this time, it was found impossible to proceed with some of these schemes. The Weardale Junction or New South Durham Railway Company, changing its name to the West Durham Railway Company,—a name which the Durham South-west Junction Railway Company had previously assumed—made arrangements with the landowners for wayleave and decided to apply later on for an Act of Incorporation. Of the Bills promoted during the session of 1837, the following received Parliamentary sanction:—

Name of Railway.	Act.		Length of Line.	Capital intended to be raised in Shares or by Loans.
	Description.	Date of Royal Assent.		
Great North of England Railway	7 Wm. IV. & I. Vic. cap. 102.	30 June, 1837	Miles. 43	£ 180,000‡
Great North of England, Clarence and Hartlepool Junction Railway	7 Wm. IV. & I. Vic. cap. 95.	3 July, 1837	9½	70,000
Bishop Auckland and Weardale Railway	7 Wm. IV. & I. Vic. cap. 122.	15 July, 1837	8½	96,000
			61	346,000

* Speech at Wolsingham, 27th September, 1836; *Durham Advertiser*, 30th September, 1836.

† Report of the Directors, 15th August, 1837.

‡ See note on p. 259.

Powers were granted to the Durham Junction Railway Company to make the Houghton-le-Spring branch; to the Durham and Sunderland Railway Company to make their Whitwell and Quarrington and Brandon branches and to deviate from their main line; and to the York and North Midland Railway Company to deviate from their main line and shorten their branches to the Leeds and Selby Railway.

Directors were appointed by the Acts of the Bishop Auckland and Weardale and Great North of England, Clarence and Hartlepool Junction Railway Companies* who held their respective general meetings on the 9th of October and 4th of November, when new boards were elected.†

Having obtained their Act, the Great North of England Railway Company decided, at a general meeting held on the 14th of August, 1837, to proceed with the making of the southern portion of the line and postpone the execution of the northern portion, although they had contracted for some of the works and, indeed, were required by Parliament to begin the construction of the Shincliffe Viaduct within six months from the time of the passing of the Act. It was important that the railway between Darlington and York should be completed simultaneously with the railways between York and Birmingham which were all, at this time, in active progress, and, on the 10th of October, the directors let the contract for the bridge over the Tees. An extension of the works northward into Durham, as far as the Clarence Railway, had been suggested to them in order that the coals of the central district might be brought upon the Great North of England Railway, but, while recognising the advantages which would accrue from the extension, they did not think it expedient with the funds at their disposal to venture north of the Tees.‡ The question of the crossing of the Tyne still continued to occupy their attention, and on the 14th of November, 1837, they gave the usual Parliamentary notices for a bridge, to commence in a piece

* *Bishop Auckland and Weardale Railway.*—Sir William Chaytor, Bart., Lowinger Hall, William Hepple, Peter Johnson, Newby Lowson, Thomas Meynell, Jun., Henry Pease, John Pease, Henry Stobart, George Hutton Wilkinson, Thomas Wilkinson.

Great North of England, Clarence and Hartlepool Junction Railway.—Robert Henry Allan, George Appleby, Rowland Burdon, Robert Burrell, William Green, John Wood, Edward Wylam.

† *Bishop Auckland and Weardale Railway.*—George Coates, Jun., Joseph Pease and Henry Pascoe Smith were elected in the place of Lowinger Hall, Thomas Meynell, Jun., and John Pease, who had retired.

First chairman: George Hutton Wilkinson.

Great North of England, Clarence and Hartlepool Railway.—Alan William Hutchinson took the place of Rowland Burdon.

First Chairman: William Green.

‡ Report of the Directors, 27th February, 1838.

of waste ground at Redheugh and terminate in Knox's Field (west of the Infirmary, on the other side of the river.* The engineers of the companies interested in the bridge reported that as the Great North of England and Brandling Junction Railways approached the Tyne at different levels, they would have to cross at different heights, say, 80 feet and 104 feet above high water mark. According to a plan which they had considered, submitted by Mr. T. E. Harrison, the dual passage of the river might be avoided by an alteration in the course of the Great North of England Railway. Diverging from the Parliamentary line near Thrislington, the railway, it was suggested, might proceed by way of Rainton Meadows, Washington, Heworth and Gateshead, portions of the Durham Junction and Brandling Junction Railways being adopted as part of it.† Though the distance between Thrislington and the Tyne would be increased by $3\frac{1}{2}$ miles, the Company would have only 15 miles to construct instead of 19. The proposed line would pass nearer to South Shields and Sunderland than the old one, but further away from Durham. The unfolding of this plan at Durham, on the 15th of November, marked an important stage in the deliberations from which resulted the linking together of the two capitals. Ten days later, on the 25th of November, 1837, the first sod of the Great North of England Railway was cut near Croft by Mr. George Hutton Wilkinson, the chairman of the Company.

* *Tyne Mercury*, 14th November, 1837.

† Report to Directors of Great North of England, Brandling Junction and Durham Junction Railway Companies, 15th November, 1837.

CHAPTER X.

THE OPENING OF MANY LINES.

[1836-41.]

After the projection of the railway to connect London and Edinburgh and the incorporation of the two companies that were formed for the purpose of carrying it forward from Normanton to Newcastle, all the earlier railways in the district may be regarded in the light of branches. During 1836 and the four subsequent years—a remarkable period of railway achievement—they were all practically completed, as if in readiness for the opening of the great trunk line.

In May, 1836, the Chilton branch of the Clarence Railway ($3\frac{1}{4}$ miles), which had been opened in the latter part of 1835 as far as the Chilton Pit, was completed to its Parliamentary termination.* The earthworks on the short branch running north from the Chilton branch to Dene Bridge Wood ($\frac{3}{4}$ mile) and intended for the accommodation of Thomas Arrowsmith, the lessee of a portion of the Dean and Chapter's royalty at Ferryhill, were also finished, but the Company waited in vain for the coals from Ferryhill, and the branch remained derelict until 1901, when rails were laid down upon it for the use of the present Chilton Colliery.

This same month (May, 1836) the Whitby and Pickering Railway was opened throughout. On the 26th, a procession of coaches, each drawn by a single horse, went from one end of the line to the other and back. In the first class coaches—the “Premier” and the “Lady Hilda”—the fare on this occasion was 5s., either inside or outside; in the second class coaches, 3s. Except at Grosmont, where four large lime-kilns were being erected by a new company—the Whitby and Grosmont Lime Company—and at Leaserigg,

* *Minutes of Evidence on Durham South-West Junction Bill*, 26th April, 1836: Minutes of Clarence Railway Committee, 24th November, 1836. The Chilton branch had hardly been opened when Christopher Mason, the proprietor of Chilton colliery, died (on the 17th May). Before this time the colliery had ceased working, unexpected difficulties having been encountered, and in October the whole of the colliery materials were sold by auction. With the exception of a few coals brought down to the branch in carts from Coundon, there was no traffic to be worked, and for some years the branch was unproductive.

where there were some extensive stone quarries, the scenery along the route was of a purely idyllic character consisting of steep wooded banks and pastoral slopes overtopped in places by ranges of gaunt crags, with green meadows and bright streams at their feet.

The principal engineering feature of the line was the self-acting inclined plane, formed through a wood between Beckhole and Goathland, $8\frac{3}{4}$ miles from Whitby. Here the coaches were attached to a rope, 1,500 yards long and $5\frac{3}{4}$ inches in circumference, passing round a horizontal grooved wheel 10 feet



Drawn by G. Dodgson.

Engraved by J. Stephenson.

HAILING THE COACH, WHITBY AND PICKERING RAILWAY.

in diameter. The other end of the rope was attached to a water tank mounted on railway wheels which, descending towards Beckhole with a preponderating load, drew up three of the coaches to the bank-head. When the tank reached the foot of the incline, it was emptied and drawn up again to repeat the same operation.* From the top of the incline there was a very gradual and scarcely perceptible rise to the summit level, which was reached at a distance of $11\frac{3}{4}$ miles from Whitby. From this point there was a fall of 434 feet to Pickering. The steepest part of the descent was between Fen Bog and

* Whishaw's *Railways of Great Britain*, 1842, p. 429.

Levisham, the principal gradients being 1 in 44·50, 1 in 55, 1 in 53·38, 1 in 68 and 1 in 77·28.* On arriving at the point where the rapid fall in inclination commenced, the horses were detached and the coaches, being coupled together, ran by gravity through Newton Dale as far as Blansby Park, within three or four miles of Pickering, attaining at times a speed of 30 miles an hour.† They were then drawn by horses to Pickering. On the return journey, two horses were required to draw each coach over the severe gradients between Raindale Mill and the summit level,‡ but gravity came into play again at Goathland, and, from the foot of the inclined plane to the Tunnel Inn at Grosmont, the vehicles required no drawing.§

A few weeks afterwards, three portions of another line, which was also associated with beautiful scenery and resembled the Whitby and Pickering Railway in the sinuosity of its course—the Newcastle and Carlisle Railway—were opened for traffic, viz.: from Blaydon to the eastern bank of the Derwent (1¼ miles) on the 11th of June,|| from Hexham to Haydon Bridge (7½ miles) on the 28th of June, and from Carlisle to Blenkinsopp Colliery (20 miles) on the 19th of July.

A procession of two trains which started from Blaydon, the first consisting of 5 carriages and 12 trucks fitted up with seats, the second of 6 carriages and 11 trucks, opened the line between Hexham and Haydon Bridge. The engines attached to the trains were the “Hercules” and the “Samson,” the one manufactured by R. Stephenson & Company, and the other by R. & W. Hawthorn. The sound of the steam whistle, with which each was provided, was now heard for the first time along the valley of the Tyne. From the carriage occupied by the Allendale Band, on the first train, floated a handsome cream-coloured silk flag embroidered with the arms of Newcastle and Carlisle, which had been presented to the directors for this occasion.¶

* *Whishaw's Railways of Great Britain*, 1842, p. 428.

† *Scenery on the Whitby and Pickering Railway*, 1836, p. 112.

‡ *Stranger's Guide from Scarborough to Pickering, and thence by the Railway to Whitby*, 1843, p. 10. § *Scenery on the line of the Whitby and Pickering Railway*, 1836, p. 115.

|| *Tyne Mercury*, 14th June, 1836.

¶ *Tyne Mercury*, 5th July, 1836. This interesting railway relic, after having been carefully preserved for 44 years, was handed over on the 28th of December, 1880, to the late Mr. Donald Fraser, who arranged to keep it at the Forth Station, “as an heirloom to be the property of the goods manager for the time being.” It was brought out at the Stephenson Centenary, on the 9th of June, 1881, and carried on a rolley by two old servants of the Company in the horse procession, and on the 18th of June, 1888, the Jubilee of the opening throughout of the Newcastle and Carlisle Railway, it was displayed on a flag-staff at the west end of the Forth Goods Station, being then “still in good condition,” but, between 1888 and 1903, it appears to have mysteriously disappeared.

Since the opening of the line between Blaydon and Hexham, picturesque station houses in architectural harmony with the character of a Border country had been built at Wylam, Stocksfield, Corbridge and Hexham, and a connection made with the new wooden bridge at Wylam (opened 25th April, 1836), which led to ironworks established on the north bank of the river by Benjamin Thompson. The principal features on the new part of the line were the trussed timber bridge, designed by Mr. Blackmore, which crossed the Tyne obliquely at Warden, consisting of 5 arches of 50 feet span



Drawn by J. W. Carmichael.

WARDEN BRIDGE.

Engraved by J. Archer.

each, resting on stone piers, and the river wall at Caponscleugh. Four lines of rails had been laid down in the station yard at Haydon Bridge, which was one of the most extensive on the whole line, accommodation having to be provided for the lead brought down from the Alston and Allendale districts, and for the stores and materials going back to the mines.

A valuable feeder to the railway was opened on the 8th of July, 1836.* This was the Hartleyburn and Brampton railway—a private colliery line which had been laid down by George Stephenson for the Earl of Carlisle,† to super-

* *Carlisle Journal*, 23rd July, 1836.

† *Ibid.*, 5th July, 1881.

sede an older waggonway crossed by the railway near the village of Milton. Immediately afterwards, the line between Milton and Carlisle may be said to have been opened for mineral traffic from the Earl of Carlisle's collieries. As there were falling gradients all the way to Carlisle, of 1 in 176 for $2\frac{1}{4}$ miles, 1 in 106 for 4 miles, and 1 in 215 for $3\frac{3}{4}$ miles,* the traffic was worked for a short time by gravity and horsepower, dandy-carts being used as on the Stockton and Darlington and other railways.†

The opening of the western portion of the Newcastle and Carlisle railway was a memorable event in the history of Carlisle, and as many as 40,000 persons are computed to have witnessed the procession of trains—of which there were four—between the city and Greenhead. The first and second trains consisted of 17 vehicles each, the third train of 9, and the fourth of 5. The locomotive engines employed on this occasion were the "Samson," the "Hercules," the "Atlas," and the "Gilsland," the two latter having been lent by Messrs. R. Stephenson & Company, and the agents of the Earl of Carlisle. On leaving the London Road Station, the trains formed one continuous line of carriages, in which were packed about 400 passengers, but shortly afterwards the "Gilsland" fell behind owing to the failure of some part of its machinery, and the spectacular effect was spoilt. Near Scotby a coupling chain on the train of the "Hercules" gave way, and the leading train had gone some distance before it was discovered that the Mayor and Corporation and all their followers were left behind. There was some laughter at the expense of the civic dignitaries, whom the wags suspected of being too weighty for such work. After waiting three-quarters of an hour at Milton for the "Gilsland" to rejoin the procession, the trains continued their journey to Greenhead, crossing the Roman Wall in two places—at Rosehill and Thirlwall Castle. They proceeded no further than Greenhead, though the line was completed to the Blenkinsopp coal pits, a mile beyond this station.‡ From the engineering point of view this section of line between Carlisle and Greenhead was one of the most interesting in the kingdom, among the many remarkable features of it being the great Wetheral Bridge, the magnificent Corby Viaduct, the immense Cowran Cut, with its high flanking retaining walls, the fine triple-arched skew-bridge beyond it across the wooded gorge of the "streaming Gelt," the Hellbeck and Fenton embank-

* Bradshaw's *Table of Gradients*, 1839.

† *Sketch of the Railroad from Carlisle to Greenhead*, by Henry Brooke, 1836.

‡ *Tyne Mercury*, 26th July, 1836; *Carlisle Journal*, 23rd July, 1836. Rd. Lowry's Diary.

ments, and the minor stone bridges across the Poltross Burn and the Petteril. There was a fine display of bunting at the Cowran Cut, a double row of flags suspended from large ropes having been stretched across it between two of the highest points.*

A month later, $9\frac{5}{8}$ miles of the Durham and Sunderland railway were brought into use, though the traffic had at first to be worked by horses, some of the stationary engines not being completed. The first waggon of coals had passed along the line from Haswell Colliery to Hendon, where there



Drawn by J. H. Carmichael.

Engraved by T. A. Prior.

SKIEW-BRIDGE OVER THE GELT.

were depôts, on the 5th of July, 1836. On the 9th of August—the fortieth anniversary of the opening of the famous Sunderland Bridge—the first coals for shipment—ten waggons of small coals—were drawn along the Haswell branch ($2\frac{3}{8}$ miles) and that portion of the main line between Murton Junction and the staiths ($7\frac{1}{4}$ miles), where eight of them were discharged into a keel by means of one of the new cast-iron drops.† The formal opening of this part of the railway took place three weeks afterwards, on the 30th of August, when several trains, with coals for shipment, ran from Haswell to Sunder-

* Lowry's Diary.

† *Sunderland Herald*, 13th August, 1836.

land. The loaded waggons, having been lowered by the Haswell engine down the colliery line as far as the Hartlepool railway and then down a part of the Durham and Sunderland line to Fallowfield, were attached at what was called the "bank-head" to a rope, 3,000 yards long, and drawn to Murton Junction by an engine of 42 horsepower stationed there to work the branch, dragging after them, round a horizontal grooved wheel, a great tail-rope 6,000 yards, or nearly $3\frac{1}{2}$ miles, in length, without a single splice,* which was to bring back the empty waggons as well as the main rope. They were then drawn along the Murton Plane, the gradient of which was 1 in 212,† by an engine of 52 horsepower, stationed at Seaton Bank Head near the crossing of the Seaham railway, again dragging a tail-rope but from another engine at Murton Junction. They ran by gravity down the bank—a steep incline $2\frac{1}{2}$ miles long, with a gradient of 1 in 60 at the upper end and a gradient of 1 in $43\frac{1}{2}$ at the lower end,‡ unwinding from the drum of the engine, as they descended, a rope 4,650 yards in length and 6 inches in circumference.§ From Ryhope, at the foot of the bank, they were hauled to Sunderland Moor, a distance of $2\frac{3}{4}$ miles, by an engine of 70 horsepower, situated near the entrance to Barrack Street, which also worked back to Ryhope a train of empty waggons up gradients of 1 in 230 and 1 in 190,|| this double operation being performed by means of three ropes, each 4,900 yards in length: the first attached to the head of the loaded set, the second to the tail of the empty set, and the third to the tail of the first, and the head of the second. While a rope was being wound round one drum, a second, through the medium of a third, which passed round the incline-wheel at Ryhope, was being unwound from another drum, thus the power of the engine was exerted over a distance of $5\frac{1}{2}$ miles, viz., from the drum in gear to Ryhope and from Ryhope back again to the drum which was out of gear.

For a time the machinery worked well, but after several trains had gone down to Sunderland, one of the drums of the Moor engine, under the pressure of the coiling rope to which so heavy a rope was attached, broke in pieces.¶ The traffic was consequently stopped on the Ryhope plane. The coals which had got through previous to the accident were drawn by horses from the sidings on the Moor to the staiths, and shipped on board the brig, "William," the rest of the cargo of this vessel being brought by horses from Ryhope the

* *Sunderland Herald*, 2nd September, 1836; Dibdin's *Northern Tour*, vol. ii., p. 1071.

† Wood's *Treatise on Railroads*, 1838, p. 760.

‡ *Ibid.*

§ *Sunderland Herald*, 2nd September, 1836.

|| Wood's *Treatise on Railroads*, 1838, p. 760.

¶ *Sunderland Herald*, 2nd September, 1836.

following day.* Within a fortnight the engine, having been provided with stronger drums, resumed work, but it was soon thrown idle again for, on the 17th of September, one of the new drums cracked† and had to be renewed. It was probably the failure of this engine which suggested a novel experiment on the line. A waggon, furnished with a temporary mast and sail, was set going at an easy pace. On the sail being trimmed to the wind, the speed increased to a rate of 10 miles an hour. A train of five waggons was afterwards attached, but no additional sail hoisted.‡ On the 6th of October the owners of South Hetton Colliery, having made a connection with the Durham and Sunderland line, sent their first cargo of coals to Sunderland.§ A week later, on the 13th of October, the Belmont branch ($\frac{3}{8}$ m.) and that portion of the main line extending from Murton Junction to the Pittington waggonway (4 miles) was opened for traffic.|| The Belmont branch was at first worked as a self-acting incline. The loaded waggons, on reaching the main line, were drawn by the Letch or Moorsley engine (52 horsepower) up an inclined plane $\frac{3}{4}$ mile long with a gradient of 1 in 68 to a point near the Alexandrina Pit, then an engine of 42 horsepower at Hetton-le-Hole hauled them over the next section ($1\frac{3}{4}$ miles) having a falling gradient of 1 in 462, and a rising gradient of 1 in 530. Between Hetton and Murton Junction, a distance of $1\frac{1}{2}$ miles, there were two steep banks, the gradient of the one being 1 in 60 and that of the other 1 in 61.¶ Up these the waggons were worked by an engine of 83 horsepower at Eppleton, and one at 70 horsepower at Murton Junction. About 14 miles of railway were thus opened, $13\frac{1}{2}$ worked by stationary engines. A further portion of the main line ($2\frac{1}{2}$ miles) and the Whitwell branch ($\frac{3}{4}$ mile) were in course of construction. The permanent way of the Durham and Sunderland Railway consisted chiefly of cast-iron rails, of fish-bellied form, in 4 feet lengths, weighing 55 and 75 pounds to the yard, seated in cast-iron chairs which were fixed to larch logs 7 feet and 8 feet in length and 6 inches in diameter at the small end. These rails were jointed together by a kind of mortice-and-tenon arrangement. On some of the embankments malleable iron parallel rails weighing 42 pounds to the yard were used. The entire absence of stone blocks at this time was a noticeable fact in connection with this railway.

* *Sunderland Herald*, 2nd September, 1836.

† *Ibid.*, 23rd September, 1836.

‡ *Railway Magazine*, October, 1836, p. 334.

§ *Sunderland Herald*, 7th October, 1836.

|| *Ibid.*, 14th October, 1836.

¶ From Table of Gradients in Wood's *Treatise on Railroads*, 1838, p. 760.



Drawn by J. W. Carmichael.

REDHEUGH STATION.

Engraved by S. Davies.

On the 19th of October "carriages with conductors" for the conveyance of passengers and parcels commenced running to and from Ryhope with every train from seven o'clock in the morning till dusk, the fare being 3d., the distance $2\frac{3}{4}$ miles.* It was not until April or May, 1837, that the service was extended and that carriages began running to Haswell with passengers for Hartlepool. The Hartlepool Company, be it noted, had frustrated the original intention of the Durham and Sunderland Company to form a connection with their main line by carrying this line over Salter's Lane at two levels, one about 7 feet above the other, leaving the Durham and Sunderland Company no choice but to pass underneath in order to effect their other purpose of joining the Haswell waggonway. This lowering of level had involved the making of a cutting 25 feet in depth and the construction of a bridge or tunnel 13 feet in span and upwards of 30 yards in length.† Passenger carriages from Sunderland, after passing through the bridge at the end of a coal train, were drawn a little way up the colliery line and then detached, when they fell back into a siding and by the momentum acquired during the descent, ran up to the level of the Hartlepool line.

The line formed by the Blaydon and Hebburn Railway Company from the Team to the Derwent ($1\frac{3}{4}$ miles) came into the hands of the Newcastle and Carlisle Railway Company in September, 1836, and, having been extended to Redheugh (1 mile) by that Company, was opened to this point on the 1st of March, 1837‡ after which date passengers and goods were conveyed by steamer and lighter between Redheugh Quay and a wharf on the north side of the river a little to the west of the old Tyne Bridge. This wharf and the Company's office behind it, in No. 66 Close, the site of which is now occupied by the western half of the Fish Market, have some claim to the distinction of being the first railway station in Newcastle. The directors had, by this time, given up their idea of crossing the Tyne at Redheugh—the expense either of raising the level of their railway to that of the deviated Great North of England line or of building a bridge of their own at this point being considered prohibitory—and they had fallen back upon their original plan of crossing the Tyne at Scotswood, deciding to proceed with the formation of the line to the higher part of Newcastle on gradients favourable to locomotive steam-power.§ On the 9th of March, 1837, the Canal branch of the Newcastle and Carlisle

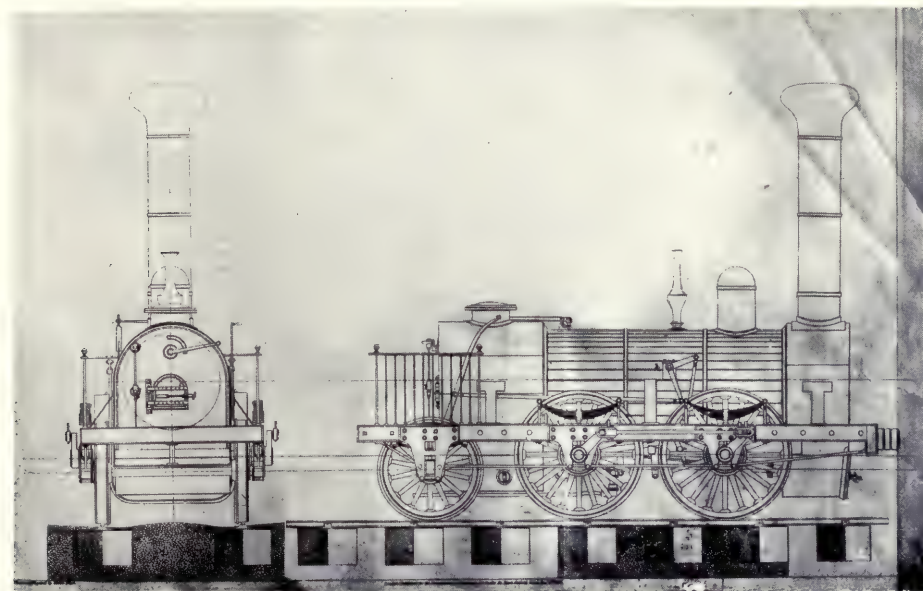
* *Sunderland Herald*, 21st October, 1836.

† *Day's Observations on the Durham and Sunderland Railway*, 1836, p. 45.

‡ *Tyne Mercury*, 7th March, 1837.

§ Annual Report to Shareholders, 28th March, 1837.

Railway, extending from the London Road Station on the south-east of Carlisle to the Canal Basin on the north-west, a distance of a mile and a half, and crossing in its course the Caldew, was formally opened, the “Hercules” with five carriages containing the directors and their friends, the “Goliath” with twenty waggons of coals from the Earl of Carlisle’s collieries and the “Atlas” also with twenty waggons of coals from the Blenkinsopp Pits passing in procession along it. At the Canal Basin, the coals were discharged by means of drops into two vessels which were waiting to receive them, this being the first shipment of coals by the railway from Carlisle.*



From "Blunt's Civil Engineer," 1837.

Drawn and Engraved by Charles Blunt.

THE "HERCULES" ENGINE (NEWCASTLE AND CARLISLE RAILWAY).

On the 31st of March, 1837, was opened the Byers Green branch of the Clarence Railway ($4\frac{3}{4}$ miles), the making of which forms a somewhat dramatic incident in the history of railways. In the summer of 1836 the Clarence Railway Company had entered into an engagement with the promoters of the New South Durham Railway to make the Byers Green branch authorised by their Act of 1829. But their powers had nearly lapsed and their funds were exhausted. A number of the shareholders, however, came forward and took

* Richard Lowry's Diary.

upon themselves the responsibility of making the branch. Most of the land required for the railway belonged to the Dean and Chapter of Durham who, after having opposed so strenuously the South Durham Railway Bill, now tried to prevent the construction of a branch railway which had been intended to form part of it. They set up a novel claim for compensation based upon the probable way-leave rents which a private company would have had to pay for passing through their lands, amounting to no less a sum than £11,963. Compensation, also on an extravagant scale, was claimed by their lessees for the value of the land and injury done by severance. The Company had no alternative but to submit these claims to a jury. A case was tried at Durham on the 26th of September, 1836. For 1 acre 9 perches (part of a farm at Ferryhill) the Company had offered £95. The jury awarded £180 to the lessees and nothing to the Dean and Chapter for loss of way-leave rents. An advance of 50 per cent. having been made by the Company in accordance with the principles laid down by the jury and accepted by the Dean and Chapter, the other claims were soon settled. The total quantity of land taken by the Company on this occasion was 14 acres 1 rood 19 perches and the sum payable amounted to £2,412 10s.* The branch was begun in October, 1836, and in spite of an unfavourable season the works, which included some heavy cuttings and embankments, were sufficiently advanced by March, 1837, to admit of the laying of the line in a temporary manner and the passage along it, on the 31st, of some waggons of coals from the Cold Knot and Old Roddymoor Collieries, these being drawn by horses.† In this way the Company obtained the certificate of having opened the line within the Parliamentary time. It was not, however, until 1841 that the line was completed to its permanent level. The West Durham and the Great North of England, Clarence and Hartlepool Junction Railway Companies were now in a position to proceed with the making of their lines, the one from the west end of the branch and the other from the east end. The first contract of the latter Company—for earthworks—was let in July,‡ and of the former—for a bridge over the river Wear near Willington—in November.§ The contract for the cuttings on that part of the Wingate branch of the Hartlepool Railway between the point of departure of the Junction Railway and the main line (49 chains) was also let in July.||

* *Durham Advertiser*, 30th September, 1836.

† *Tyne Mercury*, 4th April, 1837.

‡ Minutes of Great North of England, Clarence and Hartlepool Junction Railway Company, 25th July, 1837.

§ Minutes of West Durham Railway Company, 20th November, 1837.

|| Minutes of the Hartlepool Dock and Railway Company, 20th July, 1837.



Drawn by T. H. Hair.

Etched by T. Brown.

MIXED COAL AND PASSENGER TRAIN PASSING BROOMSIDE COLLIERY, DURHAM AND SUNDERLAND RAILWAY.

On the 6th of November, 1837, a further portion of the main line of the Durham and Sunderland Railway was opened, viz., from the Pittington waggonway to Sherburn House ($2\frac{1}{2}$ miles), together with the Whitwell branch ($\frac{3}{4}$ mile).* From Sherburn House towards Pittington there was a gradual rise of 1 in 237, 1 in 209, and 1 in 197. From Whitwell Colliery towards the main line, there was a rapid fall of 1 in 31, 1 in 65 and 1 in 69.† The traffic was worked by two stationary engines, one at Pittington, which pulled the loaded waggons from Sherburn House, and the other at Sherburn House, which drew the empty ones from Pittington; the ropes used on this section of the main line being 4,600 (afterwards 4,900) yards in length and $5\frac{3}{4}$ inches in circumference. Though the Whitwell branch was opened, it was not completed until the middle of the following year. For some months it was worked by horses and then as a self-acting incline by means of a rope 1,400 yards in length and $4\frac{1}{2}$ inches in circumference.

On the Newcastle and Carlisle Railway there were at this time 1,400 men engaged in completing the only portion which remained to be opened and, by June, 1838, there was an uninterrupted line of railway between Redheugh Quay and the Canal Basin at Carlisle, a distance of $60\frac{3}{4}$ miles. A train conveying the directors and officers of the Company travelled over the whole line on the 15th,‡ and, on the 18th—the day of Waterloo—it was opened throughout with a ceremonial display unequalled perhaps in the history of railways.

At six o'clock in the morning five trains, drawn respectively by the "Eden," "Goliath," "Atlas," "Samson," and "Hercules," set off from Carlisle with the Corporation and a large number of the inhabitants of the Border City.§ The first train, consisting of six carriages, arrived at Redheugh about 9:30 a.m. and the last a little after ten. The Corporation of Carlisle and the directors from the west crossed the river in the barges of the Mayor of Newcastle and the Trinity House, the other visitors in steam packets. This part of the day's proceedings was marred by a regrettable incident. A gangway between the Quay and one of the steam packets gave way and twelve or fourteen of the passengers from the second train, among whom were two ladies in dainty silk dresses, a physician and two surgeons from Carlisle, got a ducking in the river, which, fortunately, was not more than three or four

* Minutes of Durham and Sunderland Railway Company, 2nd November, 1837.

† Wood's *Treatise on Railroads*, 1838, p. 760. The line from Whitwell towards Sherburn House is a "descent" not an "ascent," and from Sherburn House to Pittington an "ascent" not a "descent," as stated in Mr. Wood's table of gradients on the Durham and Sunderland Railway.

‡ *Tyne Mercury*, 19th June, 1838.

§ Richard Lowry's Diary.



Drawn by J. W. Carmichael.

HELBECK EMBANKMENT.

Engraved by S. T. Davies.

feet deep at the time.* From the Close the civic bodies of Newcastle and Carlisle marched in procession by way of Grey Street to the Assembly Rooms, where they breakfasted with the directors. On returning to Redheugh about an hour after the advertised time for starting they found all the carriages occupied. The Corporation of Gateshead, by arriving in good time, had secured their seats, but the rest of the reserved carriages had been invaded by the crowd. "Thus situated," to quote the *Gateshead Observer*, "the civic authorities were reduced to the necessity of hunting for seats, and the chief magistrates of Carlisle and Newcastle were obliged to look for refuge in a pig-cart."† The High Sheriff of Cumberland, the chairman of the Company (Mr. Plummer), Sir James Grant and others also travelled in an open carriage attached to the first train. About half-past twelve o'clock the memorable procession, in which the whole of the locomotive engines belonging to the Company with the exception of the "Comet" took part, was set in motion, headed by the "Rapid" engine acting as pilot. The order of the trains was as follows:—(1) The "Meteor" with 4 carriages, (2) the "Victoria" with 9, (3) the "Wellington" with 9, (4) the "Nelson" with 7, (5) the "Lightning" with 10, (6) the "Tyne" with 9, (7) the "Carlisle" with 8, (8) the "Eden" with 10, (9) the "Goliath" with 19, (10) the "Atlas" with 17, (11) the "Samson" with 11, (12) the "Newcastle" with 9, (13) and the "Hercules" with 8.‡

Of these engines six had been manufactured by R. & W. Hawthorn, four by R. Stephenson & Company, three by Hawks & Thompson, and one by Edward Bury. The "Tyne" was fitted up with a steam organ, of which Anthony Hall, the Company's locomotive superintendent, is stated to have been the inventor.§ At Blaydon some time was spent in getting water, and the trains did not leave that station until 1.50. All the morning a moderately thick fog had covered the banks of the Tyne, and now as the procession approached Ryton the fog changed to rain, which continued to fall all the way to Brampton. Of the 3,500 persons who took this historic railway journey the greater number travelled under the conditions described by the historian of Northumberland—the Rev. John Hodgson: "As a part of the high style of comfort in which we were yesterday entertained,"

* *Gateshead Observer*, 23rd June, 1838; letter from the Rev. John Hodgson to his wife, 19th June, 1838; John Horsley's *Recollections*, *Newcastle Journal*, 16th June, 1888.

† *Gateshead Observer*, 23rd June, 1838. According to Mr. John Horsley it was in a van that Dr. Headlam, the mayor of Newcastle, found a seat.

‡ *Tyne Mercury*, 26th July, 1836.

§ *Ibid.*, 19th July, 1836.

he wrote, "I may add that one side of my bag, by lying under the seat on which I sat, had, for an hour or more, before I remembered it, amused itself with talent as a sponge and drunk up so much of the water that poured from our roof of umbrellas as to make my night things wet as itself, and dirty as the sheep truck on which we were carried: for you must know that its office was new yesterday: sheep and oxen from it on their way to Newcastle had been in the habit of gazing on the beauties of the Tyne: but now it became a pen of bipeds not hairy enough to cover themselves at once with a scaling by which each defended his own head but poured a precious stream into the cap or down the shoulders of his neighbour."* "With the trains," wrote another of the travellers, "was the new police and every now and then as we stopped there were groans at the peelers."† The journey from Blaydon to Carlisle was accomplished in 3 hours 43 minutes, 2 hours 39 minutes being the actual time spent in travelling—at an average speed of 23 miles an hour—and 1 hour 4 minutes the time consumed at various stopping-places—Stocksfield, Corbridge, Hexham, Haydon Bridge, Haltwhistle and Milton.‡ It was past six o'clock when the last train arrived at the Canal Basin, Carlisle, an hour after it was timed to leave. A disorderly stampede for refreshments took the place of a procession into the town which was to have formed part of the day's proceedings. At half-past six o'clock a number of passengers arrived at the London Road Station, where the trains were being marshalled for the return journey. These early comers took possession of the covered carriages, entering by the windows when the doors were locked. Several ladies and portly town councillors, with a temporary loss of dignity, secured comfortable seats in this way. No train, however, according to the arrangements, might start until the engineers had gone ahead to see that all was right along the line, and, as he was also required to superintend the preparations at Carlisle—the shunting and turning of the engines, the replenishing of the tenders with coke and water, the oiling of the axles of the carriages, etc.—he could not leave until every train was in travelling order. The consequence was that, long after the trains were due at Redheugh, they were still standing at Carlisle. Passengers who had taken their seats at 6:30 did not get away until nearly ten o'clock,§ having had to remain for over three hours exposed to the drenching showers in a comfortless station. In the open carriages were hundreds of ladies who, in expectation

* Letter from the Rev. John Hodgson to his wife, 19th June, 1838.

† Letter from Mr. Robert Spence of North Shields, to Mr. James Clephan, 1875. The borough police appeared for the first time in the streets of Newcastle, on the 21st of May, 1836.

‡ Sopwith's Diary.

§ *Gateshead Observer*, 23rd June, 1838.

of a sunny day and an early return, had come in light thin dresses without any preparations for unfavourable weather and a night journey. Even after starting from Carlisle, which took place amid the roar of thunder and the flash of lightning,* the unfortunate passengers had not got to the end of their troubles. A short distance from Milton Station, the "Carlisle" engine came into collision with the hinder part of the preceding train. Some carriages and a tender were thrown off the line and two passengers injured, one having a rib broken and the other a hip dislocated. This accident brought all the trains in the rear of the "Carlisle" to a standstill and there, on the verge of the Cumberland fells, they were obliged to remain until one o'clock in the morning when, the line being cleared, they were able to resume their journey.† In Newcastle and Gateshead the greatest anxiety was felt, as hour after hour passed and none of the travellers returned. Thousands of people waited all night at Redheugh for tidings of these trains, the first of which arrived about three o'clock, and as the passengers walked through the streets of Newcastle people threw up their bedroom windows to ask for news of their friends. The last train did not arrive until after six o'clock.‡

On the 24th of August, 1838, was opened for mineral traffic the little Durham Junction Railway, no longer a mere connecting link between two mineral railways, but potentially a part of the great locomotive highway between London and Edinburgh. Though only $4\frac{7}{8}$ miles in length, it possessed one of the finest engineering works in the kingdom—the lofty stone viaduct over the Wear near Low Lambton, a special object of interest to the mechanical section of the British Association, which at this time was holding its meetings in Newcastle. Commenced on the 17th of March, 1836, it had been constructed, under the direction of Mr. T. E. Harrison, at a cost of £40,338 5s. 10d.,§ by Messrs. John Gibb & Son, of Aberdeen, according to the design of Messrs. Walker & Burges—a design based upon that of Trajan's bridge at Alcantara, and characterised by strength and simplicity. The Victoria Bridge, as it was called from the circumstance of the last stone having been laid on the day of the Queen's coronation, the 28th of June,|| was an imposing structure, consisting of four main arches—one of these 160 feet

* John Horsley's recollections, *Newcastle Journal*, 16th June, 1888.

† *Gateshead Observer*, 23rd June, 1838.

‡ Letter from Mr. Robert Spence to James Clephan, 1875.

§ "It cost less in proportion to its dimensions," said Mr. David Bremner [*Proc. of Inst. Civ. Eng.*, vol. ii., p. 97], "than any similiar structure in this country."

|| Minutes of the Durham Junction Railway Company, 29th June, 1838.

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PLATE XIV.



J. W. Carmichael, del.

The Victoria Bridge over the Wear.

G. Hawkins, Junr., lith.

in span, another 144 feet, a third 100 feet, and a fourth also 100 feet* and six minor arches 20 feet each in span, the whole length of the bridge being 811 feet, its width within the parapet walls 21 feet, or outside them, 23 feet 4 inches, and its height from the foundations to the top of the parapets 156 feet 6 inches, or from high water mark to the same point, 125 feet.† Had the original design been carried out one large arch would have been erected at each end instead of three small arches, and the length of the bridge increased by 135 feet. Mr. Walker deplored the alteration made to his plan, and Mr. (afterwards Sir) Charles Barry, the celebrated architect, while admiring the general aspect and noble proportions of the bridge, condemned the small arches at each end, which impaired, in his opinion, the general solidity so essential to the character of the design.‡ There was a double line of railway over the bridge, with a flagged causeway on each side for foot passengers.§

The day's proceedings began at 9 a.m., when a party from Newcastle, comprising several distinguished members of the British Association, went down the river by steamboat to South Shields. Having seen the working of the Stanhope and Tyne drops, they were conveyed, with the South Shields party, in two trains along the Stanhope and Tyne railway to the Victoria Bridge, which was surveyed from several points of view. The trains then proceeded to Rainton Meadows, traversing the entire line, which was laid with malleable iron rails of fish-bellied form, weighing 40 pounds to the yard, supported on stone blocks measuring 2 feet square by 1 foot thick. Unfortunately, on returning, an unpleasant incident occurred: the second train, unable to regulate its speed, ran into the last carriage of the first train, which had stopped at the south end of the Victoria Bridge, and some of the passengers were injured, though not seriously. After about half-an-hour's delay the trains were able to proceed to South Shields, followed by a mineral train of 120 waggons with coals from one of the Marquis of Londonderry's pits.||

* A short time before the bridge was finished, the centres of one of the arches at the north end fell about two o'clock in the morning with a noise which, it is said, could be heard at Sunderland. The watchman, thinking the bridge had fallen, ran off to awake Mr. Gibb, who lodged at the Wood House Farm, a few hundred yards from the bridge. Mr. Gibb, however, having got a light and examined the top of the bridge, found it all right. *Ex inf.* Joseph Stephenson.

† Further particulars relating to this bridge will be found in the *Railway Magazine*, 1837, pp. 406-8; in Whishaw's *Railways of Great Britain*, 1842, p. 73; in Mr. Bremner's paper in the *Transactions of the Institution of Civil Engineers*, vol. ii., pp. 97-9; in Hann and Hosking's work on Bridges, 1842, vol. ii., cxx.-cxxii. An elevation of the bridge is shewn in plate 43 of this latter work, and a wood-cut of it, while building, appears in Richardson's *Table Book*, vol. 5, p. 40.

‡ *Life of Thomas Sopwith*, 1891, p. 138.

§ *Tyne Mercury*, 28th August, 1838.

|| *Tyne Mercury*, 28th August, 1838; *Life of Thomas Sopwith*, p. 138.

The opening of a small portion of the Brandling Junction railway (1½ miles) on the 15th of January, 1839, gave the Newcastle and Carlisle Railway Company access to a deep-water shipping place below bridge. Rising directly from Redheugh for half a mile at an inclination of 1 in 23, the line passed through a cutting, 45 feet deep in some parts, to Greenesfield—the site of the present locomotive works—where there was a stationary engine of 60 horse-power, with a chimney of picturesque design, which still showed the ravages of “Windy Monday”; it was then carried through Gateshead on a stone



Drawn by J. W. Carmichael.

SCOTSWOOD BRIDGE.

Engraved by T. Hair.

viaduct more than half a mile in length, crossing High Street by an ornamental skew-bridge. The first train, which consisted of four waggons of coals and a carriage containing the directors of the two Companies, with the Mayor of Newcastle and others, was hauled up the incline by the stationary engine, then drawn by horses to the station-yard at the head of Oakwellgate, and lowered down a self-acting incline—8 chains in length, with gradients of 1 in 8 and 1 in 12—to the quay at the east end of Hillgate, where the coals were shipped on board the “Eclipse” for Dundee.*

* Latimer's *Local Records*, p. 105; *Tyne Mercury*, 22nd January, 1839.

On the 21st of May, 1839, Carlisle was joined to Newcastle by a continuous line of rails, the section between Blaydon and Newcastle ($3\frac{3}{4}$ miles) having been formed during the two preceding years. The railway was carried over the Tyne at Scotswood, at a height of 35 feet above low-water mark, by an oblique bridge of novel construction, designed by John Blackmore, the engineer of the Company. Built wholly of timber, with the exception of the abutments, it consisted of a series of trussed ribs resting upon ten piers, which were composed of piles braced together, the span of each opening being 60 feet, measured on the skew line.* From Blaydon to the terminus near the Shot Tower, the line rose gradually at inclinations varying, for the greater part of the way, from 1 in 270 to 1 in 190.† While carrying their main line to Newcastle at a higher level than was originally planned, the Company obtained an Act to enable them to communicate with their parliamentary line and the quays which they were about to construct west of the Skinner Burn by means of an inclined plane to be worked by a stationary engine.‡ Passengers who had arrived at Blaydon and other places before noon on the 21st of May, were conveyed to Newcastle by the train which opened the new line,§ but a regular service of trains was not established between the temporary station near the Shot Tower and Carlisle until the 21st of October.||

The same month in which Newcastle was linked by railway with Carlisle, York was connected with Leeds and Selby by the opening of the York and North Midland Railway to South Milford. As the chairman of the Company (George Hudson) was at this time the Lord Mayor of York, the event was celebrated, as the *Yorkshireman* had suggested it should be, “with becoming public spirit.” On the morning of the 29th of May, a breakfast “of the most sumptuous description” was provided in the Guildhall at the Company’s expense, to which were invited the directors of the North Midland and the Great North of England Railway Companies, the officers of the 7th Hussars, the members of the Corporation and the magistrates of the city, with the beneficed clergy and gentry of York and its neighbourhood. A procession of the directors and their guests was afterwards formed in front of the Mansion House, and they proceeded to the temporary station which had been built outside of the city walls. The train provided con-

* Elevations and sections of this bridge are given in Hann and Hosking’s work on Bridges, 1843, plates 48, 49 and 50.

† Whishaw’s *Railways of Great Britain*, 1842, p. 336.

‡ Annual Report, 19th March, 1839.

§ *Newcastle Journal*, 25th May, 1839.

|| *Tyne Mercury*, 8th October, 1839. Advt.

sisted of five first-class, ten second-class, and three third-class carriages attached to two of R. Stephenson & Company's engines, the "Lowther" at the head, the "York and Leeds" at the rear. Starting from York at 1.6 p.m., the train arrived at South Milford Junction at 1.42 p.m., travelling $14\frac{1}{4}$ miles in 36 minutes, the average speed being 24 miles an hour. The train left the Junction at 2.23 p.m. and reached York at 3.4 p.m. Then there was a dinner, over which George Hudson presided, and at which George Stephenson made some interesting references to his early struggles, and the day's proceedings concluded with a ball at the Guildhall.*

Alterations had been made in the course of the original line from York to South Milford, in accordance with the Act of 1837; the directors expecting that, as the line no longer touched Lord Howden's estate, the agreement with that nobleman (see p. 285) would be void and the amount covenanted to be paid to him consequently saved, but the owner of Grimstone Park, though sustaining no damage and bestowing no benefit, had still preferred his claim for compensation, plunging the Company into litigation when they refused to recognise the claim. Judgment having gone against him in the Court of Queen's Bench, he had appealed to the Exchequer Chamber, and the decision of this court (which ultimately reversed the judgment of the lower court) was still pending when the line was opened.† Constructed under the superintendence of Thomas Cabry—the resident engineer—one of that remarkable group of clever practical men who had worked with George Stephenson, in a humble position, at Killingworth Colliery,‡ the line was well adapted to form part of the great railway thoroughfare between York and London. The gradients were peculiarly favourable, the inclination of no part of the line between York and South Milford exceeding 1 in 1,173. The rails were of single parallel form, weighing $54\frac{1}{4}$ pounds to the yard, laid to a gauge of 4 feet $8\frac{1}{2}$ inches when the sleepers were of stone, and to a gauge of 4 feet 9 inches when they were of wood,§ both kinds of sleepers being used according to the nature of the ground. A cutting through the Brumber Hill, upwards of 20 feet in depth, and an embankment over the valley of the Foss Brook, about 20 feet in height, were the principal earthworks, while the Wharfe Bridge, 274 feet in length and 30 feet 4 inches in external width, consisting of one central semi-elliptical river arch of 60 feet span and eight semi-circular land arches, each of

* *Yorkshireman*, 1st June, 1839.

† *Railway Times*, 22nd June and 6th July, 1839, pp. 481 and 520.

‡ *Summerside's Anecdotes of George Stephenson*, 1878, p. 15.

§ *Whishaw's British Railways*, 1842, p. 440; *Railway Times*, 1839, pp. 462-463.

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PLATE XVI.



Drawn and lithographed by

Ouseburn Bridge, near Newcastle-upon-Tyne.

T. M. Richardson.

15 feet span, together with three skew-bridges, each of 30 feet span on the square, by which the Acomb and Holgate, the York and Tadcaster and the Colton and Appleton roads were carried over the railway at angles respectively of 45° , 37° , and 67° , formed the chief engineering features of interest on the line.*

The opening in the bar-walls, through which the railway passed to a coal depôt and goods wharf near the North Postern, was a large four-centred archway of 70 feet span, designed by the architect, Mr. G. T. Andrews, of York. It was not completed until the latter part of July,† but several waggons of coals from Manston and Garforth passed through the walls immediately after the opening.‡

Three weeks afterwards—on the day of Waterloo—North Shields was linked by railway with Newcastle, and Sunderland with South Shields. According to Whishaw, the Newcastle and North Shields Railway presented as great an amount of skill in the construction of its works as any other line of equal length in the kingdom.§ It was celebrated for two remarkable viaducts, designed by John and Benjamin Green, the foundation stones of which had been laid on the 13th of January, 1837, by the chairman of the Company, John Hodgson Hinde, M.P. One of these, 918 feet in length, carried the line on nine arches across the valley of the Ouseburn, at a height of 108 feet above the level of the stream; the other, 1,048 feet in length, carried it on seven arches over the Willington Dene, at a height of 82 feet. The abutments and piers of both viaducts were of stone, but five of the arches of the Ouseburn Bridge and the whole of the arches of the Willington Dene Bridge were of timber, and it was the peculiar construction of these arches which made them the objects of so much interest to the members of the British Association in 1838. They presented almost the first examples in this country of that laminated form which had been successfully adopted in the Pont d'Ivry across the Seine. Formed on the Wiebeking system,|| each of the arches consisted of three parallel ribs tied to each other transversely by wrought iron bolts and diagonal braces, each rib being $3\frac{1}{2}$ feet thick and 22 inches broad, composed of 14 layers of 3-inch planks (Kyanised) from 20 to 45 feet in length and 11 inches in breadth, turned to the requisite form

* Whishaw's *British Railways*, 1842, p. 440; *Railway Times*, 1839, pp. 462-463.

† *Yorkshire Gazette*, 27th July, 1839.

‡ *Yorkshireman*, 1st June, 1839.

§ *Railways of Great Britain*, 1842, p. 351.

|| "History of Engineering," by Sir John Rennie, *Civil Engineer and Architect's Journal*, 1847, p. 53.



Drawn by J. W. Carmichael.

WILLINGTON DENE BRIDGE.

G. Hawkins, Engr., lith.

and pinned together by means of tree-nails and iron bolts. Three of the arches of the Ouseburn Bridge were, each, 116 feet in span and two 114 feet. The largest arch of the Willington Dene Bridge was 128 feet in span. Of the other six arches, four were 120 feet and two 115 feet in span. Each spandril was divided by a strong principal extending from the crown of the rib in an oblique direction to one of the piers, the upper space being filled with vertical and the lower space with radiating struts.* The stone arches at each end of the Ouseburn Bridge were introduced to give length to the abutments and to keep the embankments as far as possible from the steep sides of the ravine.† In laying the foundations of the western pier it was found necessary to fill up an old pit shaft immediately below the pier. An old worked-out coal-seam extending from the eastern pier to the east end of the bridge had also to be filled up with rubble masonry.

The oblique arches which carried the railway over the public road at Walker and Chirton (71 feet and 52½ feet respectively in skew span) were of similar construction to the timber arches of the great viaducts.

A little more than a quarter of a mile from the Newcastle terminus, the railway passed through a short tunnel about 103 yards in length, 16 feet 6 inches in height, and 22 feet 6 inches in width, “contrived a double debt to pay,” for, after having served as a tunnel during the day, it could be closed by gates and made into a carriage shed at night. One of the embankments on the line—over Pandon Dene—was 80 feet in height and one of the cuttings, three-quarters of a mile long, in Heaton township, about 25 feet at its greatest depth.‡ Within 3½ miles of its eastern terminus the railway intersected no fewer than nine waggonways, one of which, a new line from Murton Row to the Tyne, was then being formed by the Cramlington Coal Company to avoid going over a portion of the Backworth waggonway as they had previously done. The steepest gradients on the line occurred between Wallsend and Howdon where, in a section about 2 miles long, a fall of 1 in 183 was followed by a rise of 1 in 180.§ The permanent way differed from that of any other railway in the North of England at this time. It consisted of flat-bottomed rails (weighing 52 pounds to the yard) screwed down to longitudinal sleepers, 12 inches broad by 6 inches thick, and

* Hann and Hosking's work on Bridges, 1843. See plates 11, 12, 13, 14, and 15 for elevations and sections of the viaducts.

† Benjamin Green's paper on the “Arched Timber Viaducts on the Newcastle and North Shields Railway,” *Proc. of Inst. Civ. Eng.*, vol. i.

‡ Whishaw's *Railways of Great Britain*, 1842, pp. 352 and 358.

§ Bradshaw's *Table of Gradients*, 1839, p. 6.

from 20 to 50 feet in length, the rails being seated on strips of tarred felt. Tied together by crossbars of oak, which were dovetailed into them and fixed at intervals of 8 feet, this double row of longitudinal sleepers, forming continuous bearings to rails without chairs, aroused no little interest in the birthplace of railways. One line of rails only was laid down at the time of the opening, and it was not until the 18th of April, 1840, that the other was brought into use.*

What was intended to be merely a temporary station, consisting of a booking office and waiting room, with a stone platform round two sides and end,† was placed at the south-east corner of Carliol Square, the Company purposing to complete the railway afterwards to its parliamentary termination in Pilgrim Street, where they had purchased the old town house of the Peareths of Usworth, now the offices of the Poor Law Guardians.‡

Two trains were provided for the opening day, one of ten and the other of eight carriages, eleven of them being covered and seven uncovered. The locomotive engines to which they were attached, manufactured respectively by R. Stephenson & Company and R. & W. Hawthorn, were the "Wellington" and the "Hotspur." They made two trips along the line during the day, the "Wellington" leading in the morning and the "Hotspur" in the afternoon. The passengers, on alighting at North Shields, went in procession to Tynemouth, which was gaily decorated and thronged with visitors. Between four and five o'clock, about 700 ladies and gentlemen sat down, as the guests of the Company, to a liberal entertainment provided in a large marquee set up in the grounds of Tynemouth House, the chair being occupied by Richard Spoor of Whitburn. They had not been an hour under canvas when one of the most terrific thunderstorms which had occurred for many years broke over the district. The ladies sought shelter in the adjoining mansion, but the gentlemen remained to go through the toast list in spite of thunder and lightning and torrents of rain. When Mr. Joseph Lamb rose to propose "Success to the Newcastle and North Shields Railway," the chairman, with some of his

* *Gateshead Observer*, 18th April, 1840.

† *Whishaw's Railways of Great Britain*, 1842, p. 356.

‡ It was only on the 15th of December, 1840, that the directors decided to terminate the railway at the Manors, and no steps were taken to erect a station there until August, 1841. The little one-storeyed building at the south-east corner of Carliol Square, is undoubtedly the "temporary station-house," which Mr. Nicholson was authorised, on the 14th of August, to build "at as moderate an expense as possible" (Minutes). The Corporation was asked in October to allow the entrance steps to the office and passage way at the Newcastle terminus to project into the open space in front, and shortly after the 6th annual meeting, which was held on the 28th of January, 1842, "the railway station and the coal dépôt at the Manors" were opened for traffic (7th Annual Report).

friends, was crouching under a triumphal banner, and most of the guests had left their seats to congregate in the dryer parts of the tent. "This," said the *Port of Tyne Pilot*, "was almost the last act of anything like steady adherence to the established forms of large assemblies or the usages of civilised society." As the storm raged and the rain poured through the crevices in the canvas, many a health was drunk not included in the toast list, and the flooded marquee soon became a scene of noisy revelry which was not, however, without its humorous side. At half-past six o'clock the two trains set off for Newcastle with a number of drenched passengers, returning again, as soon as possible, for the remainder.*

Unlike the Newcastle and North Shields Railway, that portion of the Brandling Junction Railway which was opened between South Shields and Sunderland passed over a comparatively unbroken tract of country. With the exception, perhaps, of a cutting through the magnesian limestone at Fulwell, nearly a mile long and, in some parts, 29 feet deep,† the works were not specially noticeable. The line, which was $6\frac{1}{4}$ miles in length, comprised (1) a portion of the main line between Newcastle and South Shields; (2) the Biddick or, as it was called afterwards, the Harton branch; and (3) a portion of the main line between Newcastle and Monkwearmouth. The steepest gradients were at the South Shields end, these being 1 in 198, 1 in 142 and 1 in 270.‡ The South Shields Station stood on a site now occupied by Black's Foundry, between West Holborn and Commercial Street, this site having been formed by the removal of an old ballast hill during the construction of an embankment over the Dene Burn: the Monkwearmouth Station stood in Broad Street (now part of Roker Avenue). The formal opening of the line took place about noon, soon after the arrival of a steamboat from Gateshead and a train from Monkwearmouth, when three trains, each consisting of five carriages, passed along it, one drawn by the "Newcastle" engine, the second by the "Tyne," and the third by the "Wear."§ The procession left Monkwearmouth about four o'clock, in time to escape the terrible thunderstorm. Trains began running regularly on the 19th of June, 1839, between South Shields and Sunderland—eight each way—fares 1s. and 9d. and on the 22nd between Newcastle and North Shields—also eight each way—fares, 1s. 6d. mail, 1s. first class and 6d. second class.

* *Port of Tyne Pilot*, 22nd June, 1839.

† *Newcastle Journal*, 22nd June, 1839.

‡ *Section of the Brandling Junction Railway and Branches*, 1844.

§ The manufacturers of the first engine were Messrs. Longridge & Co., and of the two others Messrs. R. & W. Hawthorn.

On the 28th of June, 1839, another portion of the Durham and Sunderland Railway, $1\frac{1}{4}$ miles in length, was opened between Sherburn House and the Durham and Stockton road at Shincliffe.* The line approached Shincliffe through a heavy cutting in loose clay and sand about 25 chains in length, the greatest depth being 60 feet and the average depth about 40 feet.† The Clarence and Durham and Sunderland Railways were now only $3\frac{1}{2}$ miles apart, and passengers from Newcastle for Stockton went by steamboat to South Shields, travelled by the Brandling Junction Railway to Monkwearmouth, and by the Durham and Sunderland Railway to Shincliffe; they were then conveyed by omnibus to Coxhoe and, from that point, by the Clarence Railway to Stockton.

The Great North of England, Clarence and Hartlepool Junction Railway, a portion of which—five miles—as far as the junction with the East Hetton wagonway, together with the Wingate branch of the Hartlepool Railway, had been opened on the 18th of March, 1839, was now practically completed to the Clarence Railway in Thrislington valley two miles further on, and coals from Cornforth Colliery passed along it on the 11th of July, 1839.† East of Coxhoe Mill there was a rising gradient of 1 in 42 for more than a mile and a half over Garmondsway Moor, and this part of the line was worked by a stationary engine of 100 horse-power. From the bankhead towards the junction the ground fell at the rate of 1 in 159. Of this short railway Stephen Robinson was the engineer. The railway had been carried as far as Thinford Lane, within half a mile of the Byers Green branch of the Clarence Railway, and instructions given to complete the short remaining link which would enable the Company to intercept some of the West Durham coals, when they found their progress stopped by a curious legal barrier. By a strange oversight they had omitted to take power in their Act to cross the Sherburn branch of the Clarence Railway and, though they had the authority of Parliament to form a junction with the Byers Green branch, they could not transport materials across the Sherburn branch or enter that portion of the Clarence property for other purposes without the consent of the Company.§ The Clarence Railway Company showed no disposition to relinquish the favourable position in which they were placed. Foreseeing the difficulties which might arise from allowing the Junction Railway to be continued to the Sherburn branch for the accommodation of the Cornforth coals, it was arranged that the owners of the col-

* *Durham Advertiser*, 5th July, 1839. † *Whishaw's Railways of Great Britain*, 1842, p. 75.

‡ *Minutes of Annual Meeting*, 18th July, 1839.

§ Vice-Chancellor's opinion, 15th February, 1842; *Gateshead Observer*, 19th February, 1842.

liery should make a short connecting loop, 12 or 13 chains long, between the two lines from Thinford Lane to a point near the present West Cornforth Goods Station, and by this means, the Cornforth coals, after travelling for a mile and a quarter over the Junction Railway, came on to the Clarence Railway.*

A new private line which was to prove an important feeder to the Stanhope and Tyne Railway was brought into operation on the 29th of August, 1839.† This was the Sacriston waggonway extending from the colliery to the Waldrige waggonway, in conjunction with which it formed a branch railway over three miles in length. On the following day, the opening for mineral traffic of the remaining portion of the Brandling Junction main line ($7\frac{1}{2}$ miles) and the Wearmouth Dock branch ($\frac{3}{4}$ mile), completed the great line of communication between the Irish Sea and the German Ocean. On this occasion 61 chaldron waggons were conveyed in two trains from Redheugh to the head of the Dock Company's self-acting incline plane, the gradient of which was 1 in 18, lowered to the staith and shipped on board the "Jane," of Aberdeen, at the rate of a waggon in three minutes.‡ The directors and their friends having accompanied the procession in an open carriage drawn by the "Wear" engine, afterwards proceeded along the Biddick branch to South Shields, along the South Shields branch of the main line to Brockley Whins and thence to Gateshead, thus passing over the whole of the Brandling Junction Railway with the exception of the Boldon or Newton Garths branch.

Begun on the 9th of August, 1836, the works of the Brandling Junction Railway had been executed under the direction of Nicholas Wood, the resident engineer being Ralph Coulthard. In consequence of the railway passing through Gateshead on a viaduct instead of by a tunnel, as at first intended, it had been necessary to form the station at an elevation of 20 feet above that laid down on the original plan. A great mound, containing about 96,000 cubic yards of earth,§ had therefore been raised in the grounds of the old Rectory and other property acquired by the Company, and a series of arches, 25 feet high, formed on the north side of it, which were intended to be used as warehouses.|| The gradients of the railway eastward had been altered, obviating the necessity for making a separate line to Jarrow, but increasing the depth of the cuttings which,

* R. W. Jackson's Bill of Costs, 1839 ; official plan of Clarence Railway, 1842.

† *Tyne Mercury*, 31st August, 1839.

‡ *Sunderland Herald*, 6th September, 1839.

§ Report of Directors, 1st March, 1839.

|| *Newcastle Journal*, 22nd June, 1839.

beyond Heworth, was upwards of 35 feet.* At Heworth there was a short tunnel, 165 yards in length. The whole line was opened for passengers and goods traffic on the 5th of September, 1839. The first train on this occasion was drawn by the "Wear" engine from Gateshead to Monkwearmouth, carriages being detached at Brockley Whins and drawn to South Shields by the "Brandling" engine. On the 9th of September the Newton Garths branch ($\frac{7}{8}$ m.) which had been completed on the 12th of August, was brought into use and coals for shipment at the Wearmouth Dock passed on to it from the Stanhope and Tyne Railway.†

Since the 6th of February, 1839, the Brandling Company had been engaged in re-laying the old Tanfield Lea waggonway between the Colliery and Lobley Hill ($5\frac{1}{4}$ miles) and in making a short connecting line ($\frac{3}{4}$ mile) between it and the Team branch. Leaving some of the heavier works to be finished afterwards, they began the leading of coals on the 26th of November, 1839, employing horses on those parts of the line which were intended to be worked by stationary engines. By their non-fulfilment of the contract with the Marquis of Bute (see p. 283) to have the Tanfield branch ready by the 31st of December, 1836, they had rendered themselves liable to a claim for compensation, the amount of which, for the extra expense incurred in leading the coals to Dunston along the old wooden waggonway, amounted to £7,407 14s. 6d.‡

The Tanfield branch was a way-leave line, the greater portion of which was formed through the estate of Lord Ravensworth. Rising 536 feet in $3\frac{1}{4}$ miles and falling 90 feet in $2\frac{1}{4}$ miles, the line presented a series of gradients varying from 1 in 12 to 1 in 454, which involved several changes of motive power. Between Redheugh and Tanfield Lea there were three horse planes [at Tanfield Lea ($\frac{5}{8}$ m.), Lobley Hill ($\frac{1}{2}$ m.) and the Teams ($\frac{1}{8}$ m.)], three engine planes [the Causey Wood west incline ($\frac{1}{4}$ mile) the Causey Wood east incline ($1\frac{1}{8}$ miles) and the Sunnyside incline (1 mile)], and two self-acting inclines [the Lobley Hill incline ($\frac{5}{8}$ m.) with a gradient of 1 in 18 and the Fugar Bar incline or Baker's Bank (1 m.) with gradients of 1 in 12 and 1 in 21]. The Team branch ($\frac{3}{4}$ mile), one of the lines which the Blaydon and Hebburn Company were to have made, joined the Newcastle and Carlisle Railway at Redheugh and traffic from the Tanfield district had to pass over about 250 yards of that railway before it reached the Brandling Junction main line. For some time after the opening of

* *Newcastle Journal*, 2nd June, 1839.

† Brandling Junction Books.

‡ Report on the affairs of the Brandling Junction Railway, 1843, pp. 13-14.



Drawn by T. H. Hair.

HEAD OF REDHEUGH INCLINE, BRANDLING JUNCTION RAILWAY.

Etched by J. Brown.

the railway, the shipment of coals by the Company was confined to Gateshead and Monkwearmouth. Shipping places had been secured at South Shields, but to none of these could the Company obtain access without paying heavily for the privilege. The old Manor Wallsend waggonway—formed in 1810—afforded them a means of approaching Archers' Quay which they had purchased and the Malting Quay belonging to the Messrs. Brandling from which they might also ship coals, but before they could pass over the short length of line connecting their railway with the river it was necessary to re-lay it, the gauge being narrower than their own. In the agreement with the Messrs. Brandling for a lease of about 400 yards of the old waggonway, it was stipulated that the Company were not to re-lay this short branch without at the same time altering the width of the Hilda waggonway—over half a mile in length—which joined it at Grewcock's Corner, and adjusting the wheels of the colliery waggons to the widened gauge. The Messrs. Brandling were to have the use of the Company's rails on payment of 5d. per tenn (18½ chaldrons).^{*} Some delay took place in the erection of the drops owing to the heavy rain and floods which occurred in the autumn of 1839, and it was not until the 5th of February, 1840, that the Company began shipping coals at South Shields.[†] They had at this time two drops (one used jointly with the Messrs. Brandling) and a spout; the Stanhope and Tyne Railway Company had eight drops, making altogether ten drops and a spout—a very inadequate provision of shipping appliances for the quantity of coals which were beginning to come down the various railways to South Shields. There was, however, an expectation that increased shipping accommodation would be found in a dock, 20 acres in extent, which was intended to be made at the east end of Jarrow Slake.[‡] A company had been formed with a capital of £150,000 to make this dock under the authority of an Act of Parliament obtained on the 1st of July, 1839, and tenders had been invited for the whole of the works.[§] Unfortunately, the Tyne Dock Company chiefly consisted of shareholders of the Stanhope and Tyne Railway Company, at this time fast drifting into financial difficulties, and it was no doubt owing to these difficulties that the works of the dock were never begun.

An arrangement having been made between the Brandling Junction, Stanhope and Tyne and Durham Junction Railway Companies, with the object of

^{*} Appendix to Report on Affairs of Brandling Junction Railway, 1843, p. 14.

[†] *Ibid*, p. 39. [‡] Report of Directors to adjourned General Meeting, 23rd December, 1839.

[§] *Railway Magazine*, 25th September, 1839. Advt.

establishing a communication, partly by railway and partly by omnibus, between Newcastle, South Shields and Sunderland on the one hand, and Hetton, Houghton-le-Spring, Durham, Stockton and Darlington on the other, it became necessary to connect the Brandling Junction and Stanhope and Tyne lines at Brockley Whins by a short loop line about 8 chains in length, the cost of which was borne by the three Companies in equal proportions. This loop was opened on the 9th of March, 1840, when the new service of trains was started, and passengers were carried for the first time over the Durham Junction Railway.*

A few months before the completion of the Newcastle and North Shields Railway, the engineer, Robert Nicholson, made a survey for a private mineral line from Seghill to Howdon. The owners of Seghill Colliery had, from 1826, communicated with the Tyne by means of the Cramlington waggonway, but they found so much difficulty and inconvenience attending the conveyance of their coals on that line, so many stoppages occurred, and such obstacles were thrown in their way that they decided to construct a line of their own.† Having entered into agreements for way-leave, by which it was stipulated that they should pay a tentale rent to the landowners, equivalent to a toll on every chaldron of coals passing along the railway, and damaged ground rents to the tenants, they advertised for tenders for the cuttings and embankments in April, 1839,‡ and, in June, the works were reported to be “in active progress.”§ The Seghill Railway—the first section of the Blyth and Tyne Railway and now a part of the North Eastern Railway system—was opened for mineral traffic on the 1st of June, 1840.|| Proceeding in a south-westerly direction for half a mile, past the site of the present Seghill Station, it crossed obliquely the old line of the Cramlington Coal Company by a low timber bridge of two laminated arches each 81 feet 6 inches in span,¶ and ran side by side with the earlier line as far as Murton Row. At this point it diverged from the Cramlington and approached the Backworth Railway, which had suddenly curved round to the east, and the two lines went down the hillside together. Near the Newcastle and North Shields road the Seghill Railway branched off to the south-west and, crossing the Brunton and Shields Railway, followed for a quarter of a mile the course of the old line

* Directors' Report, 28th February, 1840.

† R. Nicholson, *Inquiry before Captain Washington*, 1st August, 1848.

‡ *Gateshead Observer*, 23rd April, 1839.

§ *Ibid.*, 6th June, 1839.

|| Richardson's *Table Book*, v. 5, p. 170.

¶ A plan and elevation, with other details, of this bridge are given in Brees' *Railway Practice*, 2nd series, 1840, plates 59 and 60.

which the Cramlington Company had abandoned in 1839. Rejoining the Cramlington Railway near Low Flatworth, it went down with it to the staiths at Hay Hole—now Northumberland Dock. From Seghill to Prospect Hill there were rising gradients of 1 in 228, 1 in 127, 1 in 69, and 1 in 61·5, and from Prospect Hill to the Tyne a series of falling gradients, the steepest being 1 in 63, 1 in 69, 1 in 55, 1 in 70, 1 in 25, and 1 in 31.* The line was principally worked by stationary engines, one at Prospect Hill, near the Allotment, hauling up the loaded waggons from Holywell and the empty waggons from the Newcastle and North Shields road, the other at Percy Main, close to the south side of this road, hauling the empty waggons from the staiths. From Prospect Hill to Percy Main and from Percy Main to the staiths the loaded waggons ran by gravity, unwinding from the drum of each engine a tail rope which was to bring back the empty ones, and the latter, when running by gravity to Holywell, drew out a rope for the use of the loaded waggons at the foot of the bank. The remainder of the line, from Seghill to Holywell, was worked by locomotive engines, those used at first being the “Samson” and the “John,” both of them built by Timothy Hackworth.† Another private line, a mile and a quarter in length, a portion of which afterwards formed, like the Seghill Railway, a section of the Blyth and Tyne Railway, was also laid at this time (1839-40) from the newly sunk colliery at Seaton Delaval to the Cramlington Railway at Mare Close.

On the 12th of June, a portion of another way-leave line—the West Durham Railway—was opened from Willington Colliery to the Byers Green branch of the Clarence Railway. The works had been commenced, and a considerable amount of money expended, before the passing of the Act of July 4th, 1839 (2 and 3 Vic. cap. 71), which incorporated the proprietors and authorised them to raise a capital of £33,923 in shares of £10 and £11,307 by loans.‡ From the beginning, the affairs of the West Durham Railway were hopelessly entangled with those of the Clarence Railway. The subscribers to the Byers Green branch, who had been repaid by the Clarence Railway in bonds to the amount of their subscriptions, were also subscribers to the West Durham Railway, and in consideration of the sacrifices they had made, the Company, by resolution of 27th of March, 1838, had agreed to accept their

* Plan (1851) in Office of Clerk of Peace at Newcastle.

† *Ex inf.* Robert Patterson.

‡ The following directors were appointed by this Act: Thomas Eastoe Abbott, John Blackett, John Botcherby, Thomas Brown, John Buckton, George Faith, Hunter Gordon, Adam Murray, John Charles Ord, and Foliott Scott Stokes, the latter being the first chairman of the Company.

bonds in payment for their shares at the full nominal value of the bonds and, in addition, to grant them an abatement or allowance of £1 per share. Thus, one of these subscribers claiming 100 shares, instead of paying £1,000 in cash, deposited Clarence bonds to the nominal value of £900, securities on which no banker at this time would advance more than £450. In the same liberal, but unbusinesslike, spirit the holders of South Durham scrip which had no market value whatever, were admitted shareholders on the same terms as the Clarence bondholders. The result of these transactions was that the total number of shares issued, viz., 4,771, only realized in cash £28,019, instead of £47,710, thus causing a deficiency of £19,691, of which £16,260 was represented by Clarence bonds and the remainder by South Durham scrip and allowances. The greater part of the shares (20,000) had been allotted to the Northern Mining Company, who were opening out collieries at Willington and Whitelee.*

The portion of line opened on the 12th of June was $2\frac{1}{4}$ miles in length. It consisted of a self-acting inclined plane ($\frac{1}{2}$ mile), a stationary engine plane ($\frac{5}{8}$ mile), and a locomotive plane ($1\frac{1}{8}$ miles), the gradients of which were respectively 1 in 25, 1 in 18, and 1 in 2,970.† The stationary engine was of 120 horsepower and drew the loaded waggons up to Todhills from the Wear by means of a hempen rope 1,200 yards long and 8 inches (soon afterwards $8\frac{1}{4}$ inches) in circumference. The bridge over the Wear, designed by Messrs. J. & B. Green, and built by Messrs. J. Welch & Son at a cost of £3,856, consisted of two laminated arches, each 79 feet in span, resting on stone abutments (in one of which was an oblique occupation arch) and a stone pier in the middle of the river. The length of the bridge, including the abutments, was 206 feet. The platform, which sloped towards the south-east at an inclination of 1 in 28, was 43 feet in width, having four lines of rails laid over it.§ The completed portion of the railway was opened by two trains, one consisting of seven waggons loaded with coals, the other of carriages containing the directors, the Mayor of Stockton, and representatives of the West Durham collieries, which, drawn by two of the Clarence Company's engines—the “Seymour” and the “Pilot”—ran from Todhills to Stockton.|| The Clarence Railway Company had undertaken to make the

* Report of Committee to General Meeting, 9th August, 1842.

† Plan and section of West Durham Railway, 1837 [Newcastle Public Library].

‡ *Durham Advertiser*, 13th December, 1839.

§ Brees' *Railway Practice*, 3rd series, 1847, pp. 244-5. See plate 58 for elevation of bridge.

|| *Newcastle Journal*, 20th June, 1840.

Byers Green branch a locomotive line simultaneously with the construction of the West Durham Railway, but on account of the heavy cuttings through stone, the works were not completed at the time arranged for the opening of the West Durham Railway, and it was agreed that the collieries should not begin sending coals down the line until the 19th of October.*

The opening of the West Durham coal-field was a matter of vital importance to the Clarence Railway Company, who were suffering in revenue from the effects of competition. On the 12th of December, 1839, the owners of Crow Trees Colliery had diverted their coals from the Clarence to the Hartlepool Railway,† by means of a short line ($\frac{3}{4}$ mile) across Quarrington and Cassop Hills to the Cassop Moor wagonway, which joined the Hartlepool Railway at Thornley, and in the last week of January, 1840, their example had been followed by the owners of the West Hetton Colliery. Having lost the more lucrative part of one coal-field, it would never do to allow the Hartlepool Company, with the help of the Junction Company, to capture another. They were therefore determined at all costs to prevent this diversion of traffic from their line—with what success will be seen in a subsequent chapter.

By the end of June and beginning of July, 1840, the opening of the South Yorkshire lines completed the communication between York, Hull and Leeds on the one hand, and between these important towns and the Metropolis on the other.

A second portion of the York and North Midland Railway, between Sherburn Junction and Burton Salmon ($3\frac{1}{2}$ miles), had been opened on the 11th of May, and a connection by coach established between the latter place and Masborough Station, so that it became possible to go from York to London in one day, leaving York at 7:30 a.m. and arriving in London at 9:30 p.m.‡ The remaining portion of the main line ($6\frac{3}{4}$ miles), from Burton Salmon to Altofts Junction, was opened on the 30th of June, when George Hudson and Sir John Simpson, with their fellow directors and friends, travelled over it in a train of five carriages (four first and one third class) drawn by the "Hudson" engine, afterwards proceeding along the North Midland Railway to Oakenshaw in order to take part in the opening of the railway from Leeds to Derby.§



* Report of Directors of West Durham Railway, 25th August, 1840.

† Report of Directors of Hartlepool Dock and Railway, 13th February, 1840.

‡ *Railway Magazine*, 9th May, 1840, advt.

§ *Yorkshire Gazette*, 4th July, 1840.

The works on the southern part of the line were heavier than those on the northern: they comprised a cutting three-quarters of a mile long through the Magnesian limestone at Fairburn, averaging about 48 feet in depth; a short tunnel under the Leeds and Ferrybridge road, 3 chains in length, 24½ feet wide and 22 feet high;* and a brick and stone bridge, 305 feet in length and 27 feet 4 inches in width (between the parapets), crossing the Aire by three semi-elliptical arches at an angle of 60°, the square span of each arch being 56 feet 6 inches and the skew span 65 feet. On the Methley branch, which was not opened until a month later, a bridge of similar construction and of the same number of arches, 277 feet long and 25 feet 10 inches wide between the parapets, crossed the river Calder at an angle of 75°. In the case of this bridge, the square span of each arch was 50 feet and the skew span 51 feet 9 inches. An unbroken line of railway, 217 miles long, now stretched between York and London, and the early morning passengers for London, instead of reaching their destination at 9:30 p.m., arrived there at 6:45 p.m., having been allowed half-an-hour at Derby for refreshments.

Hull and Selby Railway. FIRST CLASS. Eastrington to Departure _____ o'Clock. _____ 184 No. _____ Name _____ Paid _____			Hull and Selby Railway. FIRST CLASS. No. _____ 184 o'Clock—Departure. EASTINGTON to _____ PAID _____ <small>Passengers' Note Books are kept in the Booking Offices at Hull and Selby, in which Passengers may enter complaints of incivility or want of attention on the part of any of the Company's Servants. (See over.)</small>	
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PAPER TICKET, HULL AND SELBY RAILWAY.

There was no partial opening of the Hull and Selby Railway—the whole line, 30¾ miles in length, from one parliamentary limit to the other, was brought into use on the 1st of July. Connecting Hull with the Midlands, as well as with the West Riding of Yorkshire, it completed one of the most important trade routes in the country. Hull was the principal port of shipment for the Baltic, and the goods shipped in its docks—cottons of Manchester, woollens and linens of Leeds, lace and net of Nottingham, etc., represented in value one-fifth of the exports of the United Kingdom.

* *Yorkshire Gazette*, 4th July, 1840.

During the early part of the opening day rain fell in torrents, and a public procession through the principal streets, which was to have formed part of the ceremonial proceedings, had to be abandoned. At ten minutes past twelve o'clock four trains left Hull for Selby, the first consisting of eleven carriages, the second of eight, the third of eight, and the fourth of seven. The locomotive engines employed on this occasion were the "Exley,"* the "Andrew Marvell," the "Kingston," and the "Selby," built by Messrs.



BASCULE BRIDGE, SELBY.

Fenton, Murray and Jackson, of Leeds, and the "Prince," lent by the Leeds and Selby Railway Company. Having the Humber for a considerable distance like a broad lake on one side and the Yorkshire Wolds on the other, the trains travelled at a moderate pace past Hessle, Brough, Eastington,

* Called after John Exley, an officer of the Custom House at Hull, whose letter in the *Hull Rockingham* of 28th December, 1833, started the agitation for a railway between Hull and Selby which eventually led to the formation of the Company. *Eastern Counties Herald*, 2nd July, 1840.

and Wressle, and, crossing the Ouse in close processional order, arrived at Selby at a quarter past two. Leaving Selby at four o'clock, they travelled at an average speed of from 26 to 30 miles an hour, the first train performing the journey in an hour and a minute, exclusive of stoppages, and the others within an hour and a quarter. Brilliant sunshine having succeeded the showers, a large number of spectators had gathered to welcome the returning trains, which were loudly cheered as they passed over the embankment along the foreshore to the terminus near the Humber Dock. There was a dinner in the new goods warehouse, at which speeches were delivered by Henry Broadley, M.P., George Hudson, and others, and then a special train passed along the line from Hull to Selby, conveying the gentlemen of York and Leeds who had been present at the dinner.*

A gently undulating line, the Hull and Selby Railway had no gradient steeper than 1 in 572 except when rising towards or falling from a bridge. There was no railway in the kingdom which passed over so level a surface. For 18 miles it was as straight as an arrow. The only earthwork at all noticeable was a cutting at Hessle cliff, 40 feet deep, from which about 230,000 cubic yards of chalk and gravel had been removed.† The principal engineering feature on the line was a cast-iron bascule bridge over the River Ouse (1837-40), 191 feet 6 inches in length and 24 feet 1 inch in width over all.‡ The movable arch, allowing a clear waterway of 45 feet, consisted of two flaps, with counterpoised tail ends. Each flap, weighing $92\frac{3}{4}$ tons, was raised and lowered by means of a quadrant and rack worked by hand, the time necessary for either operation being from 50 seconds to a minute. The movable arch was first raised to admit the passage of a vessel on the 13th of February, 1840.

The most interesting feature of the Hull and Selby Railway was its permanent way, which had been adopted by Messrs. Walker and Burges after a personal examination of all the other lines in the country. About 17 miles of the railway were laid with longitudinal, and the remainder with cross, sleepers. The rails were flat-bottomed, or, as they were called, "web-footed," those used for the longitudinal sleepers— $2\frac{3}{4}$ inches in depth—weighing 55 pounds per yard, and those for the cross sleepers— $3\frac{3}{4}$ inches in depth—63 pounds. These rails, instead of being bolted down to the sleepers, as on

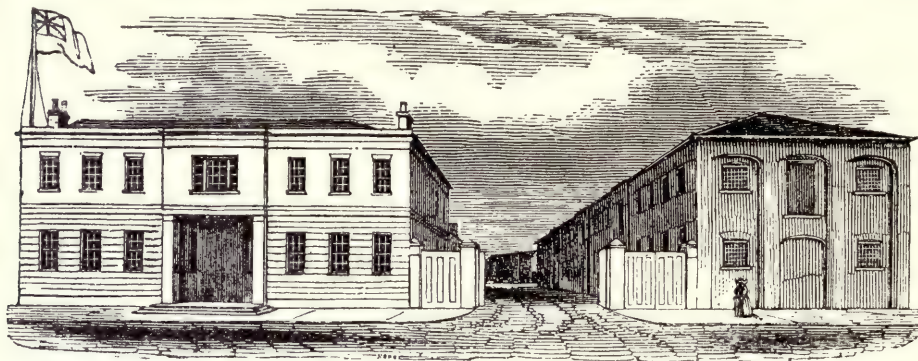
* *Leeds Mercury*, 4th July, 1840.

† *Proc. Inst. Civil Engineers*, vol. 128, p. 207, and vol. 57, p. 31.

‡ *Ibid.*, vol. 4, p. 86 (with illustrations).

the Newcastle and North Shields Railway, were set respectively in saddles and chairs, and secured to them by means of oak keys, 7 inches long.* The gauge was 4 feet 9 inches, the variation of half an inch from the standard gauge being made to give more play to the flanges of the wheels.

The first passenger and goods stations in Hull, and the various buildings connected with them—workshops, engine house, etc.—were all situated on the west side of the Humber Dock. They occupied a portion of what was known as Dock Green, and covered an area of about 5 acres. The passenger station, approached from Railway Street, consisted of (1) a stone-fronted building (100 feet by 70 feet), familiarly called the “Railway Office,” having booking office, parcels office and waiting rooms on the ground floor



Woodcut in Hull Packet, July 3, 1840.

FIRST RAILWAY STATION AT HULL (FROM THE HUMBER DOCK SIDE).

and the head offices of the Company on the first floor; and (2) the station shed (170 feet by 72 feet), the roof of which, covering four lines of rails and two platforms, was supported on twenty-two iron columns. From the entrance hall of the railway office a broad passage, 30 feet long, gave access to the trains. On the north side of the passenger station, and separated from it by the road by which passengers left the station, was the goods warehouse, 270 feet in length and 45 feet in width, having lines running through and on each side of it to the Humber Dock. The workshops, occupying an area of 5,000 square yards, had a frontage upon Kingston Street.† At Limekiln Creek, just outside the station yard, the Company had also a wharf

* Whishaw's *Railways of Great Britain*, 1842, p. 165.

† Schroeder's *Annals of Yorkshire*, vol. i., pp. 331-333.

covering about 4,000 square yards. The premises at Selby adjoining those of the Leeds and Selby Company, consisted of manager's house, booking office, waiting rooms, engine shed, etc.*

The following day, July 2nd, the Company began carrying passengers and parcels between Hull and Selby, the number of trains run in each direction being four on week days and two on Sundays. It was not until the 19th of August that the Company were able to receive goods.†

At this time the passengers between Hull and Leeds were carried along the whole length of the Leeds and Selby Railway, and those between York and Leeds along 13½ miles of it. On the 27th of July, however, the Methley branch of the York and North Midland Railway was opened, and the traffic between York and Leeds removed from the Leeds and Selby line. The North Midland Company wanted to have a share of the Hull traffic, and proposed to the Leeds and Selby Company that they should run alternate trains; in other words, that the traffic should be divided between them, but the Leeds and Selby Company refused to accede to the proposal, stating that their line was the direct route for the Hull traffic, and that, having got the traffic, they had a right to keep it.‡ The question, therefore, which presented itself to the two associated companies was how far they could compete successfully with the Leeds and Selby Company. They had the advantage of better gradients, the North Midland Station in Hunslet Lane was nearer the centre of Leeds than Marsh Lane, but, on the other hand, while the distance from Milford Old Junction to Leeds by the Leeds and Selby line was 13½ miles, the distance by the rival route was 18 miles. It was apparent to Mr. Hudson that the competition would not be favourable to the York and North Midland Company for, though they might gain some of the traffic between Hull and Leeds, they would probably lose some of the traffic between Leeds and York. An object lesson in the evils of competition was at this time being given by the Birmingham and Derby and Midland Counties Railway Companies. With that prompt tactical judgment which distinguished him, George Hudson decided to get control of the competing route. Negotiations were opened with the Leeds and Selby Company, who agreed—under the compulsion of circumstances—to grant a lease of their line to the York and North Midland Company or to the York and North Midland Company in conjunction with the North Midland Company for a term of 31 years at an annual rental of £17,000 (=a dividend of 5 per cent. on a capital of £210,000

* *York Herald*, 4th July, 1840. † Directors' Report, *Railway Magazine*, 1841, p. 224.

‡ *Railway Magazine*, 1840, pp. 834-836, 860.

and interest at 5 per cent. on a debt of £130,000), the Company or Companies to have the option of purchasing the line for £210,000 on payment of the debt then existing.* In consequence of this lease, which took effect from the 9th of November, 1840, the Leeds and Selby line was closed for passenger traffic, and passengers from Leeds to Selby and Hull had to go round by Methley. From July 2nd to November 7th, passengers from Hull to Sheffield, Derby, Birmingham and London, and from these places to Hull, changed carriages at Sherburn Junction, but on and after the 9th of November, the south curve was brought into use and the transfer of passengers took place at Milford Junction instead of Sherburn.†

The first step had now been taken towards the railway unification of the north-east part of England, and the dream of a railway system extending from the Humber to the Tweed was beginning to take shape in George Hudson's mind.

The basal line of such a system was necessarily the whole line of railway between Hull and Leeds. The Hull and Selby Company, however, to whom the Leeds and Selby Company had looked in vain for support during their negotiations with the York and North Midland Company,‡ would never have considered at this stage a proposition for the leasing of their line.§ At the same time they were unconsciously preparing the way for such a proposition by refusing to carry goods at the comparatively low rates which the other partners in the Manchester and Hull route thought necessary for keeping the traffic on the railway. The question of coercing them into harmony with the views of the other Companies was discussed at York, and it was proposed to retain the steam tugs which had previously been running between Selby and Hull. The Manchester and Leeds and North Midland Companies were invited to join in the opposition, but they declined to take shares in the Steam Tug Company, whereupon George Hudson and a few other gentlemen arranged to purchase and work the steam tugs at their own risk.|| The competition into which they were forced was peculiarly objectionable to the Hull and Selby Company, because they had previously entered into an agreement with the Leeds and Selby Company that the steam tugs should be given up as soon as the railway was ready to receive traffic: "It would be injurious," they protested, "to both Companies" and would "necessarily

* *Railway Magazine*, 1840, pp. 834-836, 860.

† *Hull Rockingham*, 7th November, 1840, advertisement.

‡ *Railway Magazine*, 1840, p. 836.

§ *Ibid.*, 1841, p. 247.

|| Minutes of York and North Midland Railway Company, 26th November, 1840.

interfere with that cordial co-operation which on every account ought to be promoted between railway companies, especially when so closely connected with each other.”* As the Hull and Selby Company had no power of retaliation, and were bound to lose the traffic which did not require quick dispatch and punctual delivery, it was only a question of time when they would come to terms.

A line to Scarborough, with a branch to the Whitby and Pickering Railway, was also an integral part of George Hudson's scheme, as it would give the York and North Midland Company command of the finest part of the seaboard and of one of the richest agricultural districts of Yorkshire. Having secured, on the 20th of July, 1840, a grant of £500 towards the

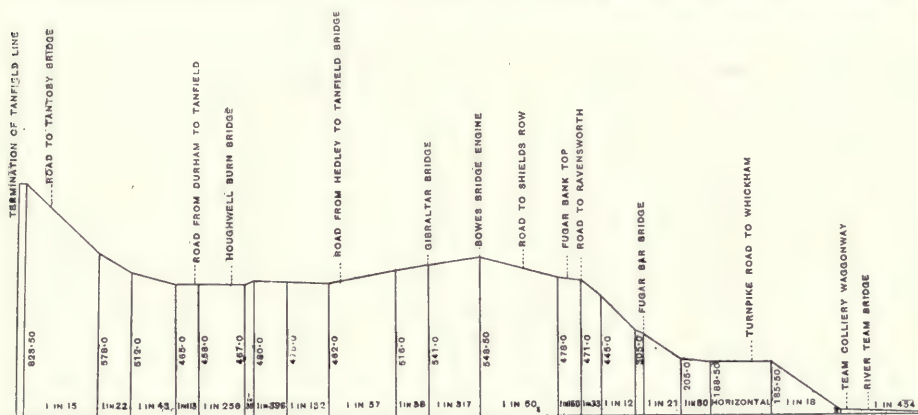


TABLE OF GRADIENTS, TANFIELD BRANCH.

making of a survey,† he had gone over the ground with George Stephenson and arranged for a survey by Robert Stephenson, besides addressing a public meeting at Scarborough and opening negotiations with the landowners.‡

The chief railway event of 1840 was to have been the opening, on the 25th of November, of the Great North of England Railway—the longest of the great Yorkshire lines—but the works were not completed in time and, much to the disappointment of the directors, this event had to be postponed until the beginning of 1841. Meanwhile two short lines in the county of Durham—the Tanfield Moor branch of the Brandling Junction Railway

* *Railway Magazine*, 1841, p. 224.

† *Ibid.*, 1840, p. 552.

‡ *Ibid.*, 1840, p. 837. Minutes of York and North Midland Railway Company, 22nd October, 1840.

(1½ m.) and the Stockton and Hartlepool Railway (8 m.)—were opened for mineral traffic, the one on the 11th of November* and the other on the 12th.

The Tanfield Moor branch was an extension line, rising from Tanfield Lea to Whitelee Head on gradients of 1 in 22 and 1 in 15,† which allowed it to be worked by gravity. It formed the last of the series of inclines, which, representing a difference of level of 800 feet in 6½ miles, make the Tanfield branch one of the most interesting lines of the North Eastern Railway system. By means of this short branch, the Brandling Junction Railway Company were enabled to divert to their own line and shipping places the Tanfield Moor coals which for six years had been conveyed along the Stanhope and Tyne Railway to South Shields. In consequence of this diversion of traffic, a mile and a quarter of the latter railway—between Tanfield Moor and Harelaw—fell into disuse. Though the Tanfield line was opened throughout, it was not until the 1st of March, 1841, that the Company were able to make use of the stationary engines in the conveyance of their coals.

The Stockton and Hartlepool Railway was really an extension of the Clarence Railway to Hartlepool. Begun in May, 1839, without the authority of an Act of Parliament, it had been executed under the direction of Messrs. George Leather and Son, of Leeds, the resident-engineer being Mr., afterwards Sir, John Fowler, at this time on the threshold of his professional career.

Leaving the Clarence Railway in the township of Billingham with a curve of 50 chains radius and half a mile in length, it proceeded in a direct course for 3¾ miles, passing near Cowpen Bewley and Greatham and, at a distance of about half a mile from Seaton Carew, to New Stranton, and along the seashore to the Middleton House estate, the property of the Hartlepool Dock and Railway Company, in which it terminated at the south-east corner of the Tide Harbour wall or embankment near a granary then in the occupation of William Lisle. From the terminus it was agreed that the Hartlepool Dock and Railway should convey the coals and goods brought for shipment along the Stockton and Hartlepool Railway around the Tide Harbour wall to the Hartlepool Railway and draw them up an inclined plane to the level of the drops, 14 feet above the embankment, the Stockton and Hartlepool Company paying a wayleave rent at the rate of £300 per mile for a right of passage through the Middleton House estate with the usual damaged ground rent

* Report of Engineer to Brandling Junction Railway Company, 22nd February, 1841.

† Section of the Brandling Junction Railway and Branches, 1844.

and inclined plane dues at the rate of 3d. per ton.* When the prospectus of the Stockton and Hartlepool Railway Company was issued in 1838, the railway was intended to communicate with, "a new dock to be formed in or adjoining the Slake at Hartlepool,† but this part of the scheme had been withdrawn by arrangement with the Hartlepool Dock and Railway Company. More than half the line was level and the steepest gradient of the other half was only 1 in 341. The principal works on the railway were (1) the Greatham Viaduct, 700 yards long, consisting of 92 brick arches 30 feet high, resting on timber piles driven into the marshy ground to a depth of 30 and, in some places, of 60 feet; and (2) the embankment, about three-quarters of a mile in length, along the Stranton shore, the seaward slope of which, curvilinear in form, was constructed of puddled clay united with the solid clay underlying the sand. Parallel rails were used, weighing about 60 lbs. to the yard, set in chairs, which were secured, according to the nature of the ground, to stone blocks or wood sleepers, the former being 2 feet square and 1 foot thick, the latter 8 feet in length and semicircular or rectangular in section.‡ For three months the mineral traffic of the Company was limited to 112 waggons of Evenwood coals conveyed in January, and it was only after the general opening, on the 9th of February, 1841, that coals in any quantity began to come down the line for shipment at Hartlepool. The Company had built a station at Stockton on the east side of the Norton Road, near the Clarence Company's station, and laid a short loop line between the main line and Stockton branch of the Clarence Railway, but objections were raised to the crossing of the Bishopton and Norton Road on the level, and, for several months, the Company were obliged to work their trains in and out of the Stockton branch under considerable difficulties, the curve eventually having to be re-formed.§

To the formation of the Stockton and Hartlepool Railway was due the completion of the Victoria Dock at Hartlepool, the works of which had been suspended since 1835. The Hartlepool Dock and Railway Company had been led to believe that about 318,000 tons of coals would annually be brought down the Stockton and Hartlepool Railway for shipment at the port, an increase of traffic which they could not possibly accommodate in the Tide Harbour. The works at the dock had, therefore, been resumed in October,

* Minutes of Hartlepool Dock and Railway Company, 14th February, 1839.

† *Tyne Mercury*, 1st January, 1839.

‡ Whishaw's *Railways of Great Britain*, 1842, p. 424-6; *Durham Advertiser*, 12th February, 1841.

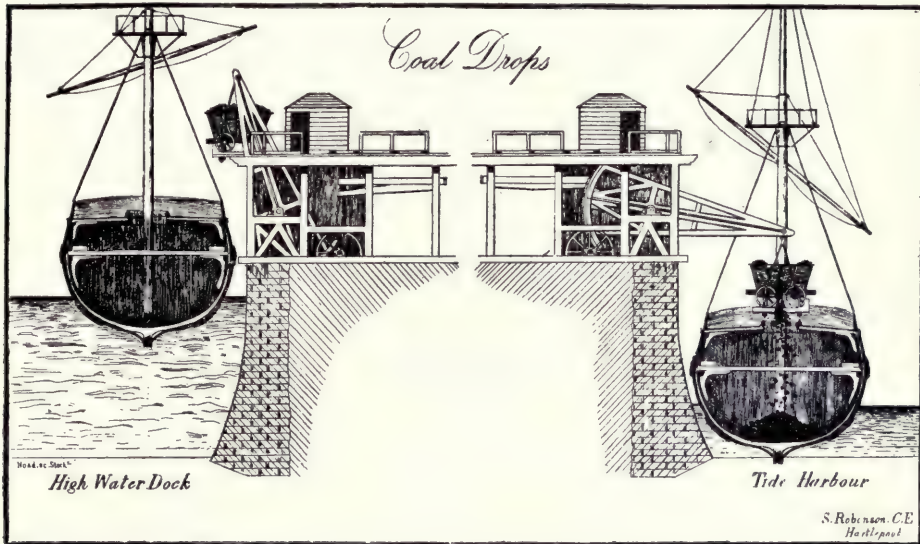
§ *Durham Chronicle*, 13th February, 1841; R. W. Jackson's Bill of Costs, July, 1841.



Drawn by J. T. W. Bell.

PLAN OF THE PORT AND TOWN OF HARTLEPOOL, 1841.

1838, and completed on the largest scale which the powers of the Act would permit at a cost, including additional drops, of about £50,000. £12,000 or £13,000 had also been expended on the works round the Tide Harbour necessary to connect the Stockton and Hartlepool Railway with the staiths.* These works comprised the finishing of a navigable lock between the Slake and Tide Harbour—made primarily for the accommodation of the Duke of Cleveland who, as Lord of the Manor of Hart, had certain shipping rights in the Slake, and the erection across it of two bridges, one an iron bascule



S. Robinson, del.

COAL DROPS, HARTLEPOOL.

Noad, Sc.

or draw bridge for carrying the railway, the other a swivel bridge for the public road.† To meet the expenditure on these works, the Company had obtained a third Act (3 and 4 Vic. cap. 109) authorising them to raise a further sum of £70,000 by shares and £2,300 by loans.

The new dock, which covered an area of $20\frac{1}{4}$ acres and had an average depth of 23 feet, was entered from the Tide Harbour by a lock 45 feet in width and 210 feet in length. The south-eastern portion of the dock occupied the site of the ancient inner harbour of Hartlepool. The dock-wall,

* Minutes of Hartlepool Dock and Railway Company, 29th December, 1842; Sharpe's *History of Hartlepool*, Supplement, 1851, p. 40.

† Illustrations of these bridges are given in the appendix to Sharpe's *History of Hartlepool*, 1851, p. xxix.

about 30 feet in height, composed of 24 courses of masonry, was 2,000 feet in length on the side next the Tide Harbour, 271 feet at the north end and 493 feet at the south east.* On the north-east side were sloped embankments for the landing of timber. The dock was formally opened on the 7th of December, the first vessel to enter it being the brig "Thomas Rowell."† The Company now had a water space of $37\frac{3}{4}$ acres without including temporary accommodation in the Slake, a portion of which they had excavated in conjunction with the Duke of Cleveland. Eight drops were at work in the Tide Harbour and one in the Victoria Dock where four others were being erected. By excavating the dock, the Company got material for widening the embankment across Hart Warren, and so were able to lay down a second line of rails for the accommodation of the growing traffic.

That Hartlepool would be a dangerous rival to Middlesbrough when the short link connecting it with the Auckland Coal-field was finished had not escaped the observation of the watchful and astute men who guided the affairs of the Stockton and Darlington Railway. The shoaling of their shipping berths had frequently caused them to deliberate upon the subject of a dock, without which, it was obvious, they would not be able to "keep pace with the improvements of adjacent ports"‡ and when, on the 18th of November, 1838, Thomas Richardson had come forward with an offer from the Middlesbrough owners to construct a dock on their estate, provided the Company would relinquish to them for a term of years the shipment of all coals brought down the railway beyond Stockton, it was gladly accepted. Laid out by William Cubitt in 1839, the dock was in the hands of the contractors in 1840, the Middlesbrough owners forming, in the spring of that year, from the Stockton and Darlington line to the dock, a branch railway about a mile and a quarter in length.

The culminating point in this series of railway celebrations was reached on the 4th of January, 1841, when the Great North of England Railway was opened for mineral traffic between Darlington and York. The first trains to pass along the railway, of which only one line was completed at this time, consisted respectively of 101 and 99 waggons of coals.§ Four Stockton and Darlington engines—the "Pilot" (A. Kitching), the "Witton Castle" (Nesham and Welsh), the "Magnet" and the "Tory" (Timothy Hackworth)—were employed on this occasion,|| two to each train. Two of the directors—Edward Oxley and

* *Tyne Mercury*, 15th December, 1840.

† *Ibid.*

‡ Minutes of Stockton and Darlington Railway Company, 16th November, 1838.

§ *Port of Tyne Pilot*, 9th January, 1841.

|| *Tyne Mercury*, 12th January, 1841.

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PLATE XVI.



T. M. Richardson, pinx.

G. Hawkins, lith.

Skew-bridge over the Tees, near Croft.

UNIV OF
CALIFORNIA

Nathaniel Plews—the secretary, Captain D. O'Brien, the engineer, Thomas Storey, and other officers of the Company, accompanied the trains which travelled at an average speed of 15 miles an hour—leaving out of account a stoppage of about two hours which occurred at Thirsk while the line was being cleared of the débris of a fallen bridge.* On arriving at York the trains were run down to the Coal Depôts, the site of which, just outside the City walls, is now occupied by the lower part of Station Road near its junction with Leeman Road.

The Great North of England Railway touched the York and North Midland Railway at one point only, just outside the City walls near the south-east corner of the present station; the connection on Hob Moor which formed part of the original plan was never made.

On the Great North of England Railway “straight lines to an extent unparalleled in this country” had been obtained “without sacrificing the gradients which nearly approached to a level.”† Between Northallerton and York there was no gradient heavier than 1 in 628, and between Northallerton and Darlington none more unfavourable than 1 in 394.‡ A portion of an older line ($1\frac{1}{2}$ m.), raised and relaid, formed part of the railway. This was the Croft branch of the Stockton and Darlington Railway which had been purchased for £20,000. The earthworks consisted of long but very light excavations and embankments. Among them, the Dalton cutting (388,742 cubic yards) and the Northallerton embankment (252,641 cubic yards) are the only ones which need be mentioned. The bridges which carried the railway over the Tees and Ouse were the principal objects of interest on the line. The former, built by Messrs. Deas and Hogg from the designs of Henry Welch, was one of the largest skew bridges in the kingdom, consisting of four segmental arches, constructed at an angle of 50° . The foundation stone was laid on the 8th of May, 1833, and the keystone of the north and last arch set on the 9th of April, 1840. The following are the principal dimensions of the bridge:—

	Feet.
Length, including flank wall	471
Height from the bed of the river to the top of the parapets ...	58
Breadth between the parapets	27
Span of arch on the square	45
Skew span of arch	60§

* *Tyne Mercury*, 12th January, 1841.

† Robert Stephenson's Report to Directors, 3rd February, 1841.

‡ Whishaw's *Railways of Great Britain*, 1842, p. 138.

§ *Proc. Inst. Civ. Eng.*, 1845, vol. iiii., p. 60.

The bridge over the Ouse at Nether Poppleton (1838-40) built from the designs of Messrs. J. and B. Green, of Newcastle, consisted of three semi-elliptical stone arches, each of 66 feet span, the height of the bridge from the bed of the river being about 30 feet and the total length 300 feet.*

The rails were of parallel form weighing about 60 lbs. to the yard. 39½ miles of line were laid with stone blocks (2 feet square and 1 foot thick)



Photo by Mayall.

Engraved by D. J. Pound.

ROBERT STEPHENSON.

and 5½ with wood sleepers. The mode of securing the rail to the chair was peculiar to this line, a block of wood, 2 inches wide, being so placed in the chair as to be prevented from moving endways and held to the rail by an iron wedge driven through the cheek of the chair.†

A part of the ceremony of the day was the opening of the new station at York, which had been built on the site of the Friars' Gardens for the joint use of the York and North Midland and Great North of England Railway

* *Railway Magazine*, 1838, p. 150.

† *Whishaw's Railways of Great Britain*, 1842, p. 141.

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PLATE XVII.



Views of York Old Station.

Companies. Designed by G. T. Andrews, of York, it was at the time considered a rather fine example of a railway terminus. The principal front, 180 feet in length, built of polished stone in the Italian style, faced Tanner Row. The station shed, about 300 feet in length and 100 feet in width, with cast-iron roof supported on columns of the same material, contained but two platforms, one for the arriving and the other for the departing trains.* Permission having been obtained from the Corporation, at a cost of £500, to make an archway through the City walls on the site of the North Street Postern, the Company had formed a roadway between Thief Lane and North Street giving the City access to the Coal Depôts.† It was intended, at this time, to build a bridge across the Ouse at Lendal, also to make a new street from Micklegate to the Railway Station, and Parliament was asked to sanction these improvements, but an unreasonable opposition on the part of the Corporation to certain protecting clauses in the York and North Midland Railway Bill led to the withdrawal of the proposals and the loss to the City for many years of a great public benefit.‡

Shortly after the opening of the Great North of England Railway, Mr. Storey, the engineer, resigned—a regrettable circumstance probably due to the failure of several of the bridges on the line. His successor was Robert Stephenson, under whose superintendence the various works were completed.

The line was opened for passenger traffic on the 30th of March, 1841, when two trains ran from a temporary station at Darlington Bank Top to York and back. On the outward journey they consisted, respectively, of seven and sixteen carriages and on the inward journey of twelve and eleven.

The engines which took part in the ceremony were all made by R. & W. Hawthorn—the “Wensleydale,” acting as pilot, the “Ouse” and “Leeds” drawing the trains.§ At the rear of the second train was a carriage called the “Gondola” (lent by the Manchester and Leeds Railway Company), which appears to have been an early form of what the Americans call an “observation car.”|| The trip to York, as well as that to Darlington,

* *Yorkshire Gazette*, 4th July, 1840.

† Sheahan and Whellan's *History and Topography of York*, 1857, vol. i., p. 332.

‡ *Railway Magazine*, 1841, p. 259.

§ *Durham Advertiser*, 2nd April, 1841.

|| The body of this carriage was about 18 feet by 7 feet and 6 feet 6 inches high. In the centre was a compartment 7 feet square, built after the fashion of a gondola, with sides of plate glass hung with silk curtains. The interior was fitted up with mahogany sofas lined with crimson plush and trimmed with silk gimp. At each end was an open platform from which passengers could view the scenery of the surrounding country. A waterproof curtain could be drawn across in case of rain. *Railway Magazine*, 1841, p. 252; *Durham Advertiser*, 2nd April, 1841.

occupied about three hours (including stoppages), which represented an average speed of 15 miles an hour. A special train conveying Mr. Joseph Pease, who had arrived at York too late to join the Darlington trains, travelled after them at the rate of 26 miles an hour.

A public dinner concluded the day's proceedings, fitly held at Darlington, in the King's Head Inn, where the first meeting of the Stockton and Darlington directors took place after the passing of the Act of 1821. It was a notable gathering over which Mr. G. H. Wilkinson, the chairman of the Company, presided, many of the guests being famous as the pioneers and organisers of the railway movement. Twenty years before, the fate of the Stockton and Darlington Bill was still hanging in the balance; now, from Carlisle to Darlington and from Darlington to London, there stretched a circuitous, but practically continuous, line of railway 381 miles in length, nearly half of it, or 186 miles, belonging to companies whose property is now a part of the North Eastern Railway. Railway company after railway company, taking part in a great co-operating movement, had done its work with almost military precision, bringing London into connection with York and Hull with Liverpool, and now another huge task was accomplished—that of the Great North of England Company, which completed the railway occupation of the country between York and Darlington.

Including $3\frac{1}{8}$ miles of the West Durham Railway which were brought into use on the 15th of June, 1841, the total number of miles open for traffic in the north-eastern part of England on the 30th of June, 1841, was 425, an increase of 256 miles in 6 years, viz.:—

						Miles Opened.	Miles Opened.
1825	}						
1835		...	...	...	...	...	169
1836		...	...	...	...	59	
1837		...	...	...	...	$12\frac{1}{4}$	
1838		...	...	...	...	$15\frac{7}{8}$	
1839		...	...	...	...	$59\frac{3}{4}$	
1840		...	...	...	...	$62\frac{1}{2}$	
1841		...	...	...	...	$47\frac{1}{2}$	
							256 $\frac{1}{4}$
							<u>425$\frac{1}{4}$</u>

The extent to which the various companies contributed to the building up of the North Eastern Railway system during the twenty years of progress completed in 1841 will be seen by the following statement:—

LINES COMPLETED UP TO 1841.

353

Name of Railway.	Miles.
Blaydon, Gateshead and Hebburn Railway	1 $\frac{3}{4}$
Brandling Junction Railway	26 $\frac{3}{8}$
Clarence Railway	36
Durham Junction Railway	4 $\frac{7}{8}$
Durham and Sunderland Railway	18 $\frac{1}{2}$
Great North of England Railway (including Croft Branch, 3 $\frac{1}{2}$ miles) ...	47 $\frac{3}{8}$
Great North of England, Clarence and Hartlepool Junction Railway ...	7
Hartlepool Dock and Railway	16 $\frac{1}{8}$
Hull and Selby Railway	30 $\frac{1}{4}$
Leeds and Selby Railway	20
Middlesbrough Dock Branch Railway	1 $\frac{1}{4}$
Newcastle and Carlisle Railway	62 $\frac{3}{4}$
Newcastle and North Shields Railway	6 $\frac{7}{8}$
Seaton Delaval Railway	1
Seghill Railway	6
Stanhope and Tyne Railway (exclusive of part of branch to Tanfield Moor, 1 $\frac{1}{4}$ miles)	36 $\frac{1}{2}$
Stockton and Darlington Railway (exclusive of Croft Branch, 3 $\frac{1}{2}$ miles) ...	37 $\frac{1}{2}$
Stockton and Hartlepool Railway	8
West Durham Railway	5 $\frac{3}{8}$
Whitby and Pickering Railway	24
York and North Midland Railway	27 $\frac{1}{4}$
	<hr/>
	425 $\frac{1}{4}$



CHAPTER XI.

RESULTS AND METHODS OF RAILWAY WORKING.

(1)

CAPITAL EXPENDITURE—DIVIDENDS—SOURCES OF INCOME—CHARGES.

The several lines enumerated in the preceding chapter had been completed at a cost of about seven million pounds. Of this enormous sum, $67\frac{1}{2}$ per cent. had been sunk in the works and 6 per cent. in the working stock; nearly 14 per cent. had been expended in the purchase of land and property and in the payment of compensation for damage; Parliamentary and Law expenses accounted for $2\frac{1}{2}$ per cent., engineering charges for 2 per cent. and general charges and interest, etc., for the remaining 8 per cent. The presence of way-leave lines in this group of railways (108 miles out of 425) had had the effect of reducing the percentage for land. The average cost of land on the principal English railways at this time is stated to have been 16 per cent. of the total outlay,* whereas on this northern system of lines, it was only 14. Comparing railway with railway, the percentages vary considerably. Short lines like the Durham Junction, and the Newcastle and North Shields Railways had expensive viaducts upon them which affected the percentage of works. In the capital account of the Newcastle and Carlisle Railway Company the item of interest was swollen by the addition of dividends paid out of capital during the formation of the line. The expenditure on working stock in the case of several lines having a large mineral traffic was conspicuously low, the explanation being that the waggons at this time were either supplied by the collieries or hired by the Railway Companies. A glance at the following tables will show the outlay upon a few of the more representative lines distributed under the usual headings of expenditure.

* *Railway Magazine*, 1841, page 848.

TABLE I.—LINES WITH PARLIAMENTARY POWERS OF PURCHASE. CAPITAL EXPENDITURE TO 30TH JUNE, 1841.

	Newcastle and Carlisle Railway [64½ m.].		Great North of England Railway [47½ m.].		York and North Midland Railway [27¼ m.].	
	£	Percentage of Total Outlay.	£	Percentage of Total Outlay.	£	Percentage of Total Outlay.
Parliamentary and Law ...	15,957	[1·55]	34,538	[3·46]	14,872	[2·72]
Engineering... ..	23,043	[2·23]	17,268	[1·73]	11,675	[2·13]
Land and Compensation ...	126,201	[12·23]	182,588	[18·31]	65,784	[12·02]
Formation of Railway—						
Earthworks	526,328	[51·01]	643,856	[64·59]	396,056	[72·40]
Permanent Way ...	193,323	[18·73]				
		69·74				
Rolling Stock	66,722	[6·47]	42,342	[4·25]	40,550	[7·41]
General Expenses	30,427	[2·95]	34,789	[3·49]	12,581	[2·30]
Interest, &c.	49,826	[4·83]	41,767	[4·19]	5,618	[1·02]
	<u>£1,031,827</u>		<u>£997,148</u>		<u>£547,136</u>	

TABLE II.—WAY-LEAVE LINES.

	Durham and Sunderland Railway [18½ m.].		Branding Junction Railway [26½ m.].		Stockton and Hartlepool Railway [8 m.].	
	£	Percentage of Outlay.	£	Percentage of Outlay.	£	Percentage of Outlay.
Parliamentary and Law ...	9,132	[3·53]	8,188	[2·04]	6,046	[3·89]
Property, etc.	24,039	[9·30]	62,793	[15·63]	6,861	[4·42]
Formation of Railway—						
Earthworks	94,003	[36·38]	174,755	[43·51]	94,191	[60·70]
Permanent Way ...	43,045	[16·66]	86,229	[21·47]	37,002	[23·84]
		53·04		64·98		84·54
Coal Shipping Staiths ...	19,099	[7·39]	5,292	[1·32]	—	—
Working Stock—						
Stationary Engines ...	39,967	[15·47]	12,708	[3·16]	—	—
Locomotive Engines ...	—	—	15,998	[3·98]	3,791	[2·44]
Carriages, Waggons, etc.	8,652	[3·35]	8,846	[2·22]	1,546	[1·00]
		18·82		9·36		3·44
General Expenses	3,500	[1·35]	10,874	[2·71]	1,728	[1·11]
Interest, etc.	16,980	[6·57]	15,929	[3·96]	4,014	[2·60]
	<u>£258,417</u>		<u>£401,612</u>		<u>£155,179</u>	

The average cost per mile of the double lines under the heads set out on the previous page was :—

Between Newcastle and North Shields (the most expensive piece of railway north of the Humber)								£
Between Darlington and York*								36,000
Between York and Normanton								21,000
Between Hull and Selby								20,000
Between Leeds and Selby								20,000
Between Newcastle and Carlisle†								17,000
								16,500

The average cost per mile of the Stockton and Darlington Railway, which had 12 miles of single line out of $37\frac{1}{2}$ miles but nearly double that length of sidings, was £13,000, that of the Whitby and Pickering Railway, justifying George Stephenson's opinion that it would be found to be the cheapest work ever done in England, £5,400.‡ As the average cost per mile of the railways of the United Kingdom, two years later, was £34,360,§ the early lines of the North Eastern Railway system come out very well in the comparison as regards economy of construction and equipment.

The expenditure per mile on land and works for the typical lines in Table I. was :—

	Newcastle and Carlisle Railway. £	Great North of England Railway. £	York and North Midland Railway. £
Land	2,000	3,900	2,400
Works (including Engineering)	12,000 ||	14,000	15,000
	<u>£14,000</u>	<u>£17,900</u>	<u>£17,400</u>

The expenditure per mile on works for the way-leave lines of Table II., reducing the single track to a double one in two cases, was :

Durham and Sunderland Railway. £	Branding Junction Railway. £	Stockton and Hartlepool Railway. £
8,000	12,700	16,400

* This was the cost per mile up to June 30th, 1841, but as there was a large expenditure on Capital Account during the two following half-years, it is evident that a considerable amount of work remained to be done after the opening of the line for traffic. By the time, therefore, that the line was quite finished and equipped the cost per mile had gone up to £25,000.

† As 15 miles of the line remained undoubled at this time, the expenditure under the head of "Permanent Way" has been treated as for 57 instead of $64\frac{1}{2}$ miles.

‡ Assuming the original cost of the line to have been, as stated by Mr. Hudson (*Railway Times*, 1844, p. 1259), £130,000.

§ *Fifth Report on Railways*, 1844, appendix, p. 5.

|| The earthworks for $64\frac{1}{2}$ miles and the permanent way for 57 miles, the 15 miles of single way being treated as $7\frac{1}{2}$ miles of double line.

Of the seven millions advanced for the formation of these various railways, docks and shipping places, etc., over three millions consisted of borrowed money which received interest at the rate of 4 and 5 per cent. and upwards. The remaining four millions, which lay unproductive during the period of construction, formed the share-capital of the several companies. How did the railway proprietor fare when the lines which he had helped to make came into operation? The earliest railway was the most remunerative. Though applying a portion of the profits to the construction of the branches, the Stockton and Darlington Railway Company were able to pay a dividend of $2\frac{1}{2}$ per cent. in 1826 (nine months after the opening of the line), of 5 per cent. in each of the succeeding four years, and of 6 per cent. in 1831. The dividends for 1832 and 1833 (notwithstanding a heavy charge against the revenue for doubling the main line) were at the rate of 8 per cent., and for 1834 and 1835—a period of depression in the coal trade—at the rate of 6.

From 1835 to 1841 the Company reaped, in a liberal measure, the reward of a prudent policy and good management, the dividends being 11 per cent. in 1836, 14 per cent. in 1837 and 1838, and 15 per cent. in 1839 and the next two years.

As a consequence of this unbroken record of prosperity, the market value of the shares rose to £260.* Up to the 1st of October, 1836, the whole of the dividend due to the shareholders was paid over to them, but, after that date, a proportion of the dividend, varying in different years, was retained by the Company on loan; bonds in lieu of it, bearing interest at the rate of 5 per cent., being given to the shareholders, who had the option of increasing their deposits and, on the issue of new stock, of converting them into shares.† By funding a portion of the dividend, the Company were able to pay off some of their loans and make provision for the extension of the works of the railway, thereby avoiding the expense of borrowing money for these purposes.

Of the other railways there were only three which realised anything like a satisfactory return to the shareholders, viz. :—

	1838.	1839.	1840.	1841.
	Per cent.	Per cent.	Per cent.	Per cent.
The Hartlepool Dock and Railway ...	5	5	6	8
The Newcastle and Carlisle Railway ...	4	6	6	5
The York and North Midland Railway ...	— ($\frac{1}{2}$ year)	$2\frac{1}{10}$	$5\frac{9}{10}$	$9\frac{1}{2}$

* *Second Report on Railways*, 1839, Qn. 4,480.

† Shareholders' Minutes, Stockton and Darlington Railway, 19th August, 1836, and 15th September, 1837.

The Leeds and Selby Railway Company, who declared a dividend of $2\frac{1}{2}$ per cent. within nine months of the opening of the line, were only just able to pay their way and divide, on four subsequent occasions, a small balance of profit among the shareholders until George Hudson took a lease of the line. A dividend of $1\frac{1}{2}$ per cent. was paid for the year ending June 30th, 1836, another at the rate of 3 per cent. the following half year, a third and a fourth at the rate of 4 per cent. for the half year ending December 31st, 1839, and June 30th, 1840— $9\frac{1}{2}$ per cent. in all, or an average of $1\frac{2}{3}$ per cent. per annum. The Stanhope and Tyne Company declared but two dividends, one for the year 1835 and the other for the year 1836, both at the rate of 5 per cent., borrowing the money to pay them. The Durham and Sunderland Company paid four half-yearly dividends, at the rate of 5 per cent. for 1838 and 4 per cent. for 1839, and then ran into debt. The Brandling Junction Company paid three half-yearly dividends (out of capital) at the rate respectively of 6, 6 and 5 per cent.; the Newcastle and North Shields Company the same number of dividends (out of revenue) at the rate of 5, 6 and 4 per cent. The Hull and Selby and Great North of England railways, which afterwards proved such valuable properties, paid very small dividends at this early stage, so soon after the opening—the one at the rate of $2\frac{1}{2}$ per cent., the other at the rate of $1\frac{1}{8}$ per cent.

Analysing the share capital of the several companies, we find that, during the first half of 1841—

£	£					
	173,000	paid a dividend at the rate of 15 per cent.				[Stockton and Darlington]
	400,000	„ „ „	9	„		[York and North Midland]
	208,900	„ „ „	8	„		[Hartlepool Dock and Railway]
210,000						[Leeds and Selby]
161,100						[Brandling Junction]
376,682						[Newcastle and Carlisle]
<hr/>	747,782	„ „ „	5	„		
	120,000	„ „ „	4	„		[Newcastle and North Shields]
	400,000	„ „ „	2	„		[Hull and Selby]
	699,100	„ „ „	$1\frac{1}{8}$	„		[Great North of England]
	<hr/>					

a total of 2,748,782 yielding an average return of 5 „

In addition to this dividend-bearing capital, there was a large amount of unremunerative capital, viz. :—

	£	
Clarence Railway	300,000	
Durham and Sunderland	139,529	
Durham Junction	74,200	
Great North of England, Clarence and Hartlepool		
Junction Railway	40,621	
Stanhope and Tyne Railway	150,000	
Stockton and Hartlepool Railway	57,070	
West Durham Railway	50,000	
Whitby and Pickering Railway	80,000	
	<hr/>	£891,420
to which must be added an amount for capital recently called up and not yet participating in the divi- dends, viz. :		
Hartlepool Dock and Railway and Newcastle and Carlisle Railway	40,728	
Total	<hr/>	<u>£932,148</u>

On the total amount of share-capital invested in the above railways, the average return at this time was only about $3\frac{1}{2}$ per cent. This was the remuneration—a very moderate remuneration it will be allowed—for an enormous amount of public service.

The work performed by the earlier railways was chiefly that of conveying coals. Of the coals for shipment, the Stockton and Darlington Railway, up to the end of 1841, had carried about four million tons and a half, the Clarence Railway over a million tons and a quarter, and the Hartlepool Railway about two million tons—carried to a river and a harbour which, until the advent of railways, knew nothing of this branch of the export trade. Over two million tons a year were being carried by the early lines towards the several ports of shipment at the close of this second railway period, viz.:—

	Tons.	Per cent.
By the Hartlepool Dock and Railway	615,000	= 27
„ Stanhope and Tyne Railway	510,000	= 22
„ Stockton and Darlington Railway	460,000	= 20
„ Durham and Sunderland Railway	370,000	= 16
„ Clarence Railway	190,000	= 8
„ Brandling Junction Railway	175,000	= 7
	<hr/>	
	<u>2,320,000</u>	

The charges made by the respective companies for carrying this traffic varied, but varied within narrow limits. The Stockton and Darlington Company charged $\frac{1}{2}$ d. per ton per mile for dues, $\frac{1}{2}$ d. per ton per mile for

haulage, besides 1d. per ton for bridge toll, and 6d. per ton for incline dues (when the coals ascended as well as descended), a charge which, in the case of collieries situated 24 miles from the shipping-place, was equal to $\frac{1}{4}$ d. per ton per mile, but, in the case of more distant ones, slightly less. During a period of strenuous competition in the coal trade (1833-4), when the coal-owners of the Tyne and Wear were leagued together to drive out the Tees coals from the London market, the Stockton and Darlington Company reduced their gross charges 17 per cent. in one half-year, 50 per cent. in the next and 40 per cent. in the third, carrying and shipping coals at rates which averaged less than $\frac{3}{4}$ d. per ton per mile. The allowances made to the coal-owners amounted, for the year ending 30th June, 1834, to nearly £14,000—equal to a dividend of 14 per cent. on the share capital.* Even in the more prosperous years which followed, the gross charges were subject to a reduction of 15 per cent.

The coals leaving the line at Simpasture for shipment at Port Clarence received very different treatment. Upon these, landsale dues were charged—without any abatement.† When the Durham County Coal Company began sending coals from their Gordon Colliery to Port Clarence—on the 1st July, 1836—they paid these dues under protest, disputing the right of the Stockton and Darlington Company to exact them.

An action under the name of Charles Barrett was brought in 1837 in the Court of Common Pleas to recover the amount of dues overcharged. The Railway Company took up the position that they were only obliged to charge the lower dues upon coals shipped oversea, contending that coals shipped coastwise for the London market were not shipped “for the purpose of exportation” within the meaning of their Act. Besides, for anything they knew to the contrary, the coals might be taken for landsale,‡ and, having no check upon the traffic after it left Simpasture, they claimed the right to charge the higher dues. The jury found a special verdict in favour of the plaintiff subject to the opinion of the judges on the legal interpretation of the Act of Parliament.§ Judgment was subsequently given against the Company who moved for a writ of error, but, anticipating the decision of

* Annual Report, 5th August, 1834.

† In the Stockton and Darlington Act, 1821, the maximum rate chargeable on coal for shipment in the port of Stockton was fixed at $\frac{1}{4}$ d. per ton per mile, whereas the maximum rate chargeable on coal for purposes other than shipment was fixed at 4d. per ton per mile.

‡ Coals carried ostensibly for export had actually been sold at Middlesbrough for home consumption in 1834.

§ Report of Committee of Clarence Railway Company, 1st August, 1837. For particulars of this case see *Durham Advertiser*, 12th April, 1839, and *Tyne Mercury*, 8th December, 1840.

the higher Court (a decision which was affirmed in 1844 by the House of Lords) they proceeded to revise their table of tolls in order to "penalize" the traffic leaving their line. The incline dues were raised from the 1st of January, 1841, to 9d. per ton (against the coals going to Port Clarence) the haulage dues were reduced to $\frac{1}{2}$ d. per ton per mile (in favour of coals going to Middlesbrough). When the owners of a colliery sent the whole of their coals down the Stockton and Darlington line no charge at all was made for haulage on those for foreign export.

The Hartlepool Dock and Railway Company charged $\frac{3}{4}$ d. per ton per mile on large coals and $\frac{1}{2}$ d. per ton on small coals, but these dues included the motive power over two self-acting planes, about a mile and a half in length the two,* the power on the other parts of the line being supplied by the coalowners. The Clarence Railway Company charged $\frac{1}{2}$ d. per ton per mile for dues on both large and small coals and $\frac{3}{8}$ d. per ton per mile for haulage.† The dues of the Stanhope and Tyne Railway were about $1\frac{1}{4}$ d. on coals conveyed over the inclined planes and $1\frac{1}{8}$ d. ($\cdot 75$ d. toll, $\cdot 38$ d. power) on coals conveyed along the locomotive portion of the line,‡ those of the Durham and Sunderland, Newcastle and Carlisle and Brandling Junction Railway Companies were $1\frac{1}{8}$ d. on all parts of the line.§ At first the Durham and Sunderland Company charged the same for small as for large coals, but after 1st June, 1838, they made a reduction of 1d. per chaldron in respect of small coals when a colliery sent the whole of its coals to Sunderland. The Stanhope and Tyne, the Newcastle and Carlisle and the Brandling Junction Companies hired their waggons and charged for the use of them, the first two at the rate of $\frac{1}{2}$ d., the third at the rate of $\frac{5}{8}$ d. per ton per mile. On the other railways the coal owners found their own waggons. Then there were shipping charges—wharfage and spoutage or drop dues—which at Middlesbrough were 2d. per ton; at Port Clarence, 1d.; at Hartlepool, $3\frac{1}{2}$ d. (wharfage 2d., drop dues $1\frac{1}{2}$ d.); at Sunderland about $1\frac{1}{8}$ d.—increased to $2\frac{1}{4}$ d. in 1840—and at South Shields (Brandling and Stanhope and Tyne Staiths) about $2\frac{1}{4}$ d. A comparison of these various charges, omitting the items for waggon rent and adding $\frac{1}{8}$ d. per ton per mile to the Hartlepool dues for haulage not performed by the Company, will show what it cost the coalowners in different parts of the northern coalfield about the year 1840 to get their coals from the

* *Minutes of Evidence on South Durham Railway Bill*, 1836, p. 91.

† *Minutes of Evidence on Durham South-West Junction Railway Bill*, 1836, p. 35.

‡ *Minutes of Evidence on South Durham Railway Bill*, 1836 (May 5th).

§ *Railway Magazine*, 1840, p. 770.

pit to the hold of the vessel: from Coxhoe the average cost was 92d. per ton per mile, from the Auckland valley 1.15d. or 1.16d. (when the rebate of 15 per cent. was in force), from Thornley and from Whitwell 1.20d., from Haswell 1.25d., from Pelton 1.30d., from Medomsley 1.39d., from Tanfield Moor by the Stanhope and Tyne Railway 1.24d., and, after 1840, by the Brandling Junction Railway, 1.44d. (inclusive of an item for way-leaves which does not appear in the other charges, equal to .18d. per ton per mile). The average cost for small coals was less in some cases than that for round coals, viz., .80d. from Coxhoe (after 1st November, 1838),* .82d. from Whitwell, .87d. from Haswell (after 1st June, 1838),† and .95d. from Thornley.

A statutory distinction was made on some of the early railways, as we have seen, between coals for exportation and coals for landsale. While the coalowner of the Auckland Valley could send coals to Stockton for exportation for about 1.08d. per ton per mile he was liable to be charged 2.52d. per ton per mile if they were sent to the depôts for home consumption, but as there was an alternative route to Stockton *viâ* the Clarence Railway, the Stockton and Darlington Company, after the 1st of September, 1834, returned him 1s. per ton, equal to .55d. per ton per mile, charging the same dues whether the coals went to Middlesbrough or Stockton. And further, manufacturers of earthenware on the banks of the Tees, who brought the whole of the coals used in their works down the Stockton and Darlington Railway received, after 1837, a bounty of 1s. per ton.‡ The Durham and Sunderland and Newcastle and Carlisle Companies also distinguished between export and landsale coals, the respective charges for the latter being 2¼d. and 1¾d.

Little work was done by the early railways of the North of England, previous to 1840, in the conveyance of goods. Consequently a very small proportion of their total revenue was derived from this traffic. In 1839 the proportion was only 3 per cent. in the case of the Stanhope and Tyne Railway, 4 per cent. in that of the Durham and Sunderland and Hartlepool Railways and 8 per cent. in that of the Stockton and Darlington Railway. So unprofitable was this traffic on the Durham and Sunderland Railway that, in 1838, the directors passed a resolution in favour of discontinuing it. On two of the lines only—the Leeds and Selby and the Newcastle and Carlisle Railways—did goods rank in importance with minerals, the proportion of

* General order, Clarence Railway, 2nd May, 1838.

† Durham and Sunderland Minutes, 15th May, 1838.

‡ Stockton and Darlington Minutes, 8th September, 1837, and 5th February, 1841.

the revenue which they contributed being, in the one case, 37 per cent. and, in the other, 32 per cent. The goods traffic of the Leeds and Selby Railway consisted largely of wool and woollen goods, that of the Newcastle and Carlisle Railway of lead and timber. The rates for general merchandise on both lines were from 3d. to 4d. per ton per mile. Many goods which arrived at Newcastle from the Baltic were forwarded to Carlisle by railway and re-shipped at that place for Liverpool. These "goods twice sea-borne," were carried for 2d. per ton per mile. A rapid economic result of the establishment of the Newcastle and Carlisle Railway was the formation of commercial relations between Newcastle and the North of Ireland. Early in February, 1839, the Railway Company received about 100 tons of goods from the Solway steamer,* and from this time a good deal of Irish bacon travelled along the Newcastle and Carlisle line. One provision-merchant alone imported 20 tons of bacon weekly from Belfast—a species of trade which did not exist before the opening of the railway.† The goods traffic of the Stockton and Darlington Railway was for nine years in the hands of carriers, but neither the charges made nor the facilities given by them were satisfactory, and the Company, finding that a large quantity of timber and other goods continued to go by the turnpike road, took the traffic into their hands from the 12th of December, 1834, employing some of the carriers to superintend the working of it.‡

It was probably on the Leeds and Selby Railway, at the end of 1834, or early in 1835, that live stock was first carried in the district served by the North Eastern Railway. There is no record of this traffic on the Stockton and Darlington Railway previous to August, 1836. On the 9th of this month the directors were informed that "on Monday last four horned cattle went down from St. Helen's Auckland, to Darlington: they rode well and did not seem to take any harm."§ The Newcastle and Carlisle Company began carrying live stock soon after the first section of their line came into use, but it was only after the opening of the Newcastle Cattle Market on the 21st of June, 1839, that they were able to regard this traffic as "another source of revenue."|| A fish traffic on a small scale was conducted by a few of the early lines previous to 1840. In 1837 turbot and soles, conveyed by the Newcastle and Carlisle Railway, began to arrive in the Newcastle

* Rd. Lowry's Diary, 4th February, 1839.

† *Chambers Journal*, 1840, p. 174.

‡ Report of Directors of Stockton and Darlington Railway, 12th August, 1835.

§ John Graham's Reports.

|| Report of the Directors of the Newcastle and Carlisle Railway, 26th March, 1841.

market, having previously been rarely seen there.* On the Whitby and Pickering Railway the carriage of fish accounted for 5 per cent. of the total receipts in 1840, and it was no uncommon thing on the York and North Midland Railway to convey 24 tons of fish per day.† One of the many schemes associated with the name of Christopher Tennant was intended to supply the large Yorkshire towns with fresh fish from Hartlepool by means of the railway, and it was during a visit to Leeds with the object of promoting this scheme that he died, on the 12th of September, 1839.‡ The Northern Fishing Company, established in March, 1841, on the lines which he advocated, began to send fish daily to Leeds and Manchester,§ and the railways for a time reaped the benefit of an organised traffic.

The passenger traffic on the early mineral lines was considered very much in the light of a bye-product. On the Stockton and Darlington Railway, it was for eight years in the hands of certain coach-proprietors who carried, on an average, 510 passengers a week between Stockton and Darlington, 74 between Shildon and Darlington, and 324 between Stockton and Middlesbrough.|| The tolls which they paid for the use of the line for the year ending 30th June, 1833, amounted to £611. Up to this time the Stockton and Darlington Railway was practically—what the projectors of the line intended it to be—a public highway. People even used it as a foot-road, some with the sanction of the directors—medical men under certain conditions between sunset and sunrise,¶ and occasionally a funeral procession, the latter paying an acknowledgment of 6d. for the privilege.** but a great many others passed along it without leave or licence. There was also a deal of irregular travelling in the tenders and waggons and especially in the dandy-darts.†† A coach would sometimes come up the line empty while the waggons of a train in front of it were carrying a number of unbooked passengers. It was found necessary to station inspectors at various points of the line to report such cases, these men receiving, in addition to their wages, one half of the fines levied on offenders.‡‡

The difficulty in regulating the traffic while private carriers were using the line led the Company in 1833 to buy out the coach proprietors, and take over their stock of coaches. Immediately afterwards they began carrying

* *Tyne Mercury*, 25th April, 1837.

† Speech by Mr. Oxley at Great North of England half-yearly meeting. *Railway Magazine*, 1841, p. 262.

‡ *Leeds Mercury*, 21st September, 1839.

§ *Gateshead Observer*, 13th March and 1st May, 1841. || *Jeans' Jubilee Memorial*, 1875, p. 85.

¶ Minutes, 2nd December, 1831. ** *Ibid.*, 9th December, 1831, and 16th March, 1832.

†† For description of dandy-cart see chapter iv., pp. 153-4. ‡‡ Minutes, 23rd March, 1832.

passengers on their own account, viz., between Stockton and Darlington from the 1st October, 1833, between Shildon and Darlington, and St. Helen's Auckland and Shildon from the 1st of December, 1833, and between Stockton and Middlesbrough from the 7th of April, 1834. The Company did not carry passengers on the Sunday, but they would lend a coach to anyone who wished to run it on that day for 1d. per mile,* charging for the use of the railway the maximum toll of 6d. per mile.†

Until 1835 there were only two classes of passengers on the Stockton and Darlington Railway. The fares at first between Stockton and Darlington (11½ miles) were 1s. 6d. and 1s., but, on improving the service, the fares were raised to 2s. and 1s. 6d. respectively. One could, however, travel by the slow or merchandise trains at the old fares.

The Stockton and Darlington Railway appears to have been one of the first lines on which provision was made for the poorer class of railway travellers. A large number of persons, it was found, who could not afford to pay the fourpenny fare between Stockton and Middlesbrough had got into the habit of walking along the railway. In order to stop a dangerous practice and secure additional revenue, the directors decided to carry third-class passengers on the Middlesbrough branch‡ in waggons without springs but furnished with seats,§ “the same to be hauled by the coal engines as often as there may be a sufficient number of passengers to go either way.”|| These third-class trains began running on the 14th of December, 1835, the fare being 2d., or practically ½d. per mile. In May, 1838, between 800 and 900 persons a week availed themselves for this cheap mode of travelling.¶ A “one shilling carriage”—equivalent to a third-class carriage—was attached to the ordinary train on the main line two days a week.** Another convenience enjoyed on the Stockton and Darlington Railway was the privilege of travelling on the engine of a coal train at the ordinary “inside fare” when there was not a passenger train available.†† Persons found trespassing on the Middlesbrough branch—after the Company had got power under Lord Seymour's Act to deal effectively with them—often preferred to go forward with the coal trains at 6d. each to turning back, and as many as twenty-six would sometimes be ticketed to Middlesbrough by the engines from the old

* Minutes, 16th May, 1834.

† *Second Report on Railways*, 1839, Qn. 4,426.

‡ Minutes, 27th November, 1835.

§ John Graham's Reports, 4th December, 1835.

|| Minutes, 11th December, 1835. ¶ John Sidgwick's Minute Book, 18th to 30th May, 1838.

** Old Time Table, 4th March, 1836. *Proc. Inst. Civil Engineers*, 1890, p. 190.

†† Minutes, 11th July, 1834, and 29th May, 1835.

river bridge between the hours of 10 p.m. and 1 a.m.—a novel source of revenue!*

The receipts from passenger traffic on the Stockton and Darlington Railway for the year ending 30th June, 1835—£4,209—formed 7 per cent. of the total revenue and for the year ending 30th June, 1841—£11,303—10 per cent.

No passenger traffic was worked on the Clarence Railway before the 11th of July, 1835, when the Company's "new coaches"—vehicles not unlike waggonettes or brakes at the present day with steps at the end—began running from Stockton to the Clarence Tavern, Crow Trees and back twice a day, the fares, including conveyance by road from Crow Trees to Durham, being: inside 3s. 6d., outside 2s. 6d.† A few months afterwards was formed the Clarence Coach Company to whom the Railway Company granted the exclusive privilege of carrying passengers on their line for two years from the 1st of January, 1836.‡ This new company ran the coaches at a loss, and in November, 1837, gave up the contract.§ From this time to June, 1838, the passenger traffic was suspended. It was then let to Stephen Walton for three years at $\frac{1}{4}$ d. per passenger per mile, he paying the Government duty.|| His trains, drawn by locomotive engines, began to run on the 20th of June, 1838, the fares between Stockton and Coxhoe ($16\frac{1}{4}$ m.) being 2s. 6d. inside and 2s. outside. 10,077 passengers were carried during the half-year ending 31st December, 1838, and the gross receipts amounted to £949,¶ which, if the company had worked the traffic themselves, would have been about equal to 10 per cent. of their total revenue.

The Stanhope and Tyne Railway Company did not begin carrying passengers until the 16th of April, 1835, and then only between South Shields and the Durham Road, near the corner of Lambton Park. "It was only the force of circumstances," said Mr. T. E. Harrison, "that compelled us to take passengers at all. We had constant applications from poor people to ride on the coal waggons and, at first, permission was granted them to ride on the waggons without any payment at all, then passenger carriages were put on the way to save the trouble of these applications and to obviate the risk of accidents. We first put on an open carriage attached to the coal train, afterwards we ran a coach once a fortnight on pay days with an engine

* Police Reports, 11th November, 1840, 5th May and 10th November, 1841.

† *Durham Chronicle*, 17th July, 1835.

‡ Report of Clarence Railway Committee, 14th January, 1836.

§ *Second Report on Railways*, 1839, Qn. 5,361.

|| *Ibid.*, Qn. 5,369.

¶ *Ibid.*, Appendix, p. 386.

at considerable loss. In 1835, from April 16th, we carried 2,814 passengers. There was a considerable loss that year by carrying passengers, not less than £220. In 1838 we carried 17,490 passengers. There was an apparent gain that year of £117 15s. In 1839 we carried 15,010 passengers. In that year I consider the loss was £166 6s. 10d. Up to the close of 1839 I think there was distinctly a loss to the Company and I recommended the directors to discontinue it. They thought it a great public convenience and determined not to discontinue it."* Not only did the Company carry passengers at a loss but, in doing so, they got entangled in legal difficulties. One of the leaseholders of the Dean and Chapter of Durham, William Wallis of Westoe, through whose field—the Deeps—the railway ran for a distance of 331 yards, made a claim for additional compensation, on the ground that the right of way-leave reserved in his lease by the Dean and Chapter and assigned by them to the Company was only for minerals. In making a railway for general purposes, the Company, he contended, had exceeded the powers granted to them. He brought an action against them in 1839 and obtained a verdict for £127. There was a good deal of subsequent litigation and the case was eventually carried to the Exchequer Chamber and decided in favour of the plaintiff.† A working arrangement which the Stanhope and Tyne Company made with the Brandling Junction Company in 1840 had the effect of increasing the number of passengers carried to about 70,000 a year.‡

The Hartlepool Dock and Railway Company left the carrying of passengers on their line to private enterprise, confining themselves to taking toll for the use of the line, viz., 3d. per mile. Licences were granted to two partnerships formed for the purpose of running carriages on the line, one on the 21st of July, 1836, and the other on the 26th of October, 1837. These parties ran coaches, drawn by horses, between Haswell and Hartlepool until the 1st of May, 1839, when the Company began to run their own coaches. All the Company received in tolls in 1836 was £2 18s. 9d. in respect of 235 miles run, and, indeed, the total amount received under the licences up to the 30th of April, 1839, was only £300 5s. 10½d.§ During the second half year of 1839 the receipts from passengers represented 6 per cent. of the total revenue—a percentage maintained in 1840.

* *Durham Advertiser*, 12th March, 1841.

† *Ibid.*, 15th March, 1839; *Sunderland Herald*, 27th November, 1840; *Durham Advertiser*, 12th March, 1841, and 7th February, 1842.

‡ *Durham Advertiser*, 12th March, 1841.

§ W. Davison to Burrell and Donkin, 11th December, 1840.

On the Durham and Sunderland Railway there was a rapid development of passenger traffic: the proportion of the revenue which it furnished was 4 per cent. in 1838, 10 per cent. in 1838 and 18 per cent. in 1839.

The competition between the Durham and Sunderland and the Hartlepool Railway Companies for the same traffic prevented them from acting effectively together as partners in what was then the most direct route to the south by railway. In 1840, when the route was threatened by a combination between the Brandling Junction, Stanhope and Tyne and Durham Junction Companies, they obtained leave from the Hartlepool Company, not without difficulty, to run one of their own coaches twice a day between Haswell and Castle Eden in connection with a four-horse omnibus which they proposed to run between the Railway Tavern near Castle Eden and the Railway Hotel at Stockton. This combined railway coach and omnibus service was started on the 10th of February, 1840* (the fares from Sunderland to Stockton by this route were 5s. and 4s., or 6d. lower than those by Rainton and Coxhoe) and discontinued in the spring of 1841, soon after the Stockton and Hartlepool Railway had been opened for passengers.

Up to 1839 the only lines on which the passenger traffic contributed a greater proportion of the revenue than either goods or mineral traffic were the Leeds and Selby and the Newcastle and Carlisle Railways. On the Leeds and Selby Railway this proportion was 38 per cent. in 1838 and 45 in 1839; on the Newcastle and Carlisle Railway, 41 per cent. in 1838 and 38 in 1839. The Leeds and Selby Company started with comparatively low fares, viz., 3s. first-class and 2s. second-class between the two terminal stations, a distance of 20 miles. From the 8th November, 1835, they raised their fares to 4s. and 3s., a step which resulted, during 1836, in the loss of 12,000 passengers, but a gain in income of £1,324. They raised the fares again from the 22nd May, 1837, to 5s. and 4s., introducing a third-class fare of 3s. The effect was most instructive. In six months they lost 19,000 passengers and their revenue suffered to the extent of £1,285. Recognising that a mistake had been made, they reduced the fares from the 31st October, 1837, to 4s., 3s., and 2s. 6d. The accounts for 1837 showed a loss of 30,000 passengers, but a slight gain of £30. It was some time before the people who had been driven away got into the habit of travelling again.†

* *Sunderland Herald*, 7th February, 1840. (Advt.)

† *Second Report on Railways*, 1839, Qns. 3,907-3,919; *Fifth Report on Railways* 1844, Appendix, p. 360.



J. W. Carmichael, del.

Early Travelling on the Newcastle and Carlisle Railway.

H. Griffiths, sc.

On the Newcastle and Carlisle Railway there were trains which only stopped at the principal stations and others which stopped at them all. By the former—the “quick” or “mail” trains—the fares were 11s. and 8s. 6d., by the latter 10s. and 7s. 6d.. There were nearly as many miles travelled by passengers on the Newcastle and Carlisle Railway in 1838 as on all the other early lines of the North Eastern Railway put together.

The following tables show the results achieved on these lines in the conveyance of passengers during 1838 and 1839.

Name of Railway.	Miles travelled by Passengers. 1838.		Miles travelled by Passengers. 1839.	Increase.		Decrease.
	No.	Percentage of Total.	No.	No.	No.	
Newcastle and Carlisle ...	3,123,664	[46]	4,080,752	957,088		
Leeds and Selby ...	1,533,208	[20]	2,368,088	834,880		
Stockton and Darlington ...	1,284,784	[19]	1,548,656	263,872		
Durham and Sunderland ...	517,643	[7]	829,632	311,989		
Whitby and Pickering ...	259,400	[4]	244,628			14,772
Clarence ...	128,360	[2]	357,952	229,592		
Stanhope and Tyne ...	136,458	[2]	117,078			19,380
	6,983,517		9,546,786			
Newcastle and North Shields			1,896,792	1,896,792		
Brandling Junction ...			1,366,449	1,366,449		
York and North Midland ...			962,288	962,288		
	6,983,517		13,772,315*			

Several of the railways opened between 1839 and 1841 owed to passengers between 70 and 80 per cent. of their revenue, others between 50 and 60 per cent. The time had come for the railway companies to “condescend to men of low estate” and provide a cheap if not a comfortable accommodation for them. The York and North Midland Company gained the favour of the public by carrying third-class passengers from the first;† the Hull and Selby Company from the opening day, and the Great North of England Company three months after the opening day,‡ followed their example. The fares on the later lines were relatively high, especially was this the case on the Great North of England Railway. The fares on some of the lines, however, were modified by the competition of steamboats and road coaches. Between York and Leeds the distance by road was less by five miles than the distance by rail, and, on this account, first-class passengers were carried at the rate of 2½d. per mile, though, in travelling to Normanton, they were charged

* Compiled from Account of Duty paid, Appendix to *Fifth Report on Railways*, 1840, p. 468.

† *Sunderland Beacon*, 19th September, 1839.

‡ George Hudson, Evidence before Select Committee, 1844, Qns. 4,282-4,284.

at the rate of 3d. a mile.* Between York and Hull, the competition of the steamboats reduced for a time the second-class fare from 6s. 6d. to 4s. 6d. and the third-class fare from 4s. 6d. to 2s. 6d.† Between Newcastle and North Shields the fares at first were 1s. 6d. mail, 1s. first-class and 6d. second-class. Very few passengers travelled in the mail carriages‡—only 1,236 in six months—and these carriages were therefore discontinued. The second-class fare was raised, from the 1st December, 1840, to 9d., but the public could still travel for 6d. in third-class carriages which were, on this date, placed upon the line.§ Express trains, or mail trains as they were called, began running without a stop from Newcastle to North Shields [$6\frac{3}{4}$ m.] in 12 minutes on the 24th May, 1841,|| but no extra charge was made for the increased facility. Subsequently the competition of the river steamboats brought the fares down to 9d. first-class, 6d. second-class, and 4d. third-class. The Brandling Junction Company had also to assimilate their fares, first- and second-class to those on the north side of the river, lowering them from 1s. and 9d. to 9d. and 6d.

Let us briefly compare the charges of the various Companies. The fares between terminal stations of the Stockton and Darlington, Clarence, Hull and Selby and Stockton and Hartlepool, of the Newcastle and Carlisle by the slow trains, of the Whitby and Pickering by certain coaches, of the Brandling Junction during the first year were all reducible to a rate per mile of 2d. first-class and $1\frac{1}{2}$ d. second-class. Passengers on many of the other lines travelled more cheaply,—on the Stanhope and Tyne Railway at the rate of $1\frac{3}{4}$ d. and $1\frac{1}{4}$ d., on the Durham and Sunderland at the rate of $1\frac{1}{5}$ d. and 1d. between Shincliffe and Sunderland and at the rate of $1\frac{2}{3}$ d. and $1\frac{1}{3}$ d. between Sunderland and Haswell and, on the Hartlepool Railway, at the rate of $1\frac{1}{2}$ d. and 1d. The reduced fares of the Newcastle and North Shields Railway averaged $1\frac{3}{4}$ d. and $1\frac{1}{3}$ d. per mile in 1840 and $1\frac{1}{3}$ d. and 1d. in 1841, those of the Brandling Junction Railway to South Shields 1d. and $\frac{3}{4}$ d., and those between York and Hull 2d. and 1d. The third-class fares on the lines between York and Hull, on the Newcastle and North Shields Railway and on the Seghill Railway (opened for passenger traffic 28th August, 1841) were slightly over $\frac{1}{2}$ d. per mile. In the “quick trains” of the Newcastle and Carlisle Railway, passengers were charged at the rate of $2\frac{1}{4}$ d. per mile first-class and $1\frac{3}{4}$ d. second-class, on the Leeds and Selby Railway and in the “Premier” coach of the Whitby and Pickering Railway

* *Railway Magazine*, 17th July, 1841, p. 610.

† *Ibid.*, 4th December, 1841.

‡ A superior type of first-class carriages used on the express trains.

§ Minutes of Newcastle and North Shields Railway Company, 14th October, 1840.

|| *Tyne Mercury*, 25th May, 1841.

2½d. and 2d., and on the Great North of England Railway 3¼d., and 2d. at first, but afterwards at the rate of 3¼d., 2¼d. and 1½d. On no section of the great trunk line between Darlington and London could one travel in 1841 at a cheaper rate than 3d. per mile, first-class, and 2d. per mile, second-class.

The fares between the terminal and intermediate stations or between one intermediate station and another were generally on a higher scale



G. Dodgson, del.

TUNNEL NEAR GROSMONT.

J. T. Wilmore, sc.

than those between the terminal stations; on the Newcastle and North Shields line there was a minimum charge from and to any of the intermediate stations of 6d. first-class and 4d. second-class.*

It has been shown that the pioneer of third-class accommodation on railways for the poorer class of passengers was the Stockton and Darlington

* *Gateshead Observer*, 16th October, 1841.

Railway. To other lines of the North Eastern Railway the public are indebted for the introduction of the excursion system. Probably the first line on which passengers were carried at special fares was the Whitby and Pickering Railway. The occasion was a bazaar held on the 7th and 8th of August, 1839, for church building purposes at Grosmont. The usual fare to Grosmont from Whitby was 9d. and from Pickering 2s. 3d., but, to increase the number of visitors to the bazaar, the fare was reduced in the one case to 6d. and in the other to 1s. 6d., coaches being run from Whitby every hour after 9 o'clock in the morning and from Pickering as often as required.* The excursion system really dates from 1840. It was the outcome of special arrangements for the benefit of Mechanics' Institutes originating with the Newcastle and Carlisle Railway. There had been opened in Newcastle on the 6th April, 1840, a Polytechnic Exhibition of great interest, and it was suggested to the directors of the Railway that they should allow visitors to the Exhibition from Carlisle to travel at reduced fares by certain trains. The suggestion was adopted and tickets at 10s. each were issued on the 13th, 15th, 20th, and 22nd of May by the "mixed" train leaving Carlisle at 5.45 a.m., available for return by the "quick" train leaving Newcastle at 5 p.m.† As ordinary passengers travelling in the second-class or open carriages would have had to pay 16s., namely, 7s. 6d. by the "mixed" train and 8s. 6d. by the "quick" train, the reduction amounted to 6s. A Sunday excursion train was the next railway novelty. The first train of this kind, consisting of 15 carriages drawn by the "Wellington" engine, left Newcastle for Carlisle on the 14th June, 1840, with about 320 passengers—the agents and workmen of Messrs. R. and W. Hawthorn and their friends, whom the Company had agreed to carry at half price on a certain number being guaranteed.‡ On the 22nd of June, the members of the Leeds Mechanics' Institute had a trip to York by the Leeds and Selby and York and North Midland Railways, evidently paying half the ordinary fares as the price of the tickets issued to them (which included a charge for tea at York) was only 6s. first-class, 5s. second-class, and 4s. third-class.§ A second Sunday excursion train ran on the 9th of August, 1840, from Leeds to Hull, with upwards of 1,250 passengers; it consisted of 40 carriages, the largest number in one train, which, up to that time, had

* Minutes of Whitby and Pickering Railway Company, 31st May, 1839.

† *Carlisle Journal*, 2nd May, 1840; *Tyne Mercury*, 5th May, 1840.

‡ *Carlisle Journal*, 27th June, 1840; *Tyne Mercury*, 23rd June, 1840.

§ *Leeds Mercury*, 27th June, 1840. A trip had been made to Leeds on the 29th of July, 1839, by the members of the York Mechanics' Institute to the number of 295, but there is no evidence to show that they travelled at reduced fares.

traversed any railway in the kingdom.* On the 15th of August, 1840, the following resolution was passed by the Newcastle and North Shields Board:—"That the Rev. Mr. Atkinson be permitted to take the scholars and the teachers of the Gateshead Fell National School to Tynemouth on Saturday next, or any other day, at half-price, namely, free one way and pay the other."

The explanatory paragraph in the minute may seem superfluous, but there is more in it than appears at first sight. Had the single fare been charged for the whole distance travelled, namely, $13\frac{1}{2}$ miles, the Government duty payable by the Company, which was $\frac{1}{8}$ d. per passenger per mile, irrespective of class or rate, would have been 28 per cent. of the gross receipts, in other words, out of the single third-class fare of 6d. the Government would have received $1\frac{3}{4}$ d. [$13\frac{1}{2}$ miles at $\frac{1}{8}$ d. per mile] and the Company $4\frac{1}{4}$ d. or about $\frac{1}{3}$ d. per mile. The difficulty which presented itself to the Newcastle and North Shields Company in giving cheap accommodation to the public had been faced a few months earlier by the Manchester and Leeds Company. On being asked to carry a number of children from Manchester during the race-week they had proposed to sell one-third of the tickets required and give away the remainder.† In 1841 the excursion system spread to other lines. On the 31st of May, 1841, there were cheap trips from Stockton to Castle Eden and from Sunderland to York. By the one the members of the Stockton Mechanics' Institute were carried 38 miles for 2s.‡ and by the other the members of the Sunderland Mechanics' Institute travelled 180 miles for 10s. 6d., having to pass over five different lines. Of all these early trips, none attracted so much public attention as a Sunday excursion run on the 29th of August from Newcastle to Carlisle. This was due to an extraordinary protest launched against it by the Rev. W. C. Burns of Kilsyth, who happened to be in Newcastle at this time. By means of placard and handbill this gentleman—afterwards a missionary of some note in China—denounced the trip in the following sensational terms:—

A Reward for Sabbath Breaking.

People taken safely and swiftly to Hell!

Next Lord's Day, by the Carlisle Railway, for 7s. 6d.

It is a Pleasure Trip!§

* *Eastern Counties Herald*, 13th August, 1840.

† Capt. Lawes, Evidence before Select Committee on Railways, 1840, Qns. 4,280-4,282.

‡ *Gateshead Observer*, 29th May, 1841.

§ *Tyne Mercury*, 31st August and 7th September, 1841; *Memoir of the Rev. W. C. Burns, M.A.*, 1870, p. 218.

The morning after the trip another bill appeared on the walls of the town announcing the safe return of the trippers from the place—not watered by the Eden—to which reference had been made in the previous notice. Hardly had the echoes of the agitation died away when the Brandling Junction Company gave notice of a series of Sunday trips from Gateshead to Monkwearmouth Baths (*viâ* the Dock Branch not previously used for passengers) to commence on the 5th of September, the fares for the double journey being 2s. first-class and 1s. second-class.* So successful were these trips, upwards of 1,100 passengers travelling by the two trains which ran on the 19th September, that they were continued until the 2nd October.†

Not only had many of the early railway companies adopted the excursion system in 1840, but one of them—the Hull and Selby Company—had within six months of the starting of the system given special facilities to “persons frequenting the Hull market.”‡ Tickets were issued every Tuesday by the train leaving Selby at 9 a.m. to second and third-class passengers “allowing them to return *free of charge* by the train leaving Hull at 3 in the afternoon.”§ To a writer on railway subjects who witnessed the departure of one of these market trains from Hull, with nearly 400 passengers, it was “a fine illustration of the effect of low fares.”||

The principle of compounding for tolls had been conceded by the Stockton and Darlington Railway Company as early as 1834, when they granted leave to Joseph Taylor of Middlesbrough to run a coach to Stockton and back on Sundays and Fridays for the purpose of conveying his family to their place of worship at £10 per year.¶ An application from a passenger to the Leeds and Selby Board the same year “to make a composition for a certain number of tickets annually to and from Milford” met with a blank refusal.** Though granted on the London and Greenwich and Dublin and Kingstown Railways, periodical tickets did not come into use in the North of England until 1841. They were first granted by the Hull and Selby Company as an experiment which the directors did not pledge themselves to continue, persons residing on the line of railway being allowed to travel as often as they thought proper on the payment of one fare daily.††

Some of the Companies had other sources of income than those already mentioned. The Stanhope and Tyne Railway Company got a better return

* Handbill, dated 3rd September, 1841.

† *Gateshead Observer*, 25th September, 1841.

‡ Minutes of Hull and Selby Railway Company, 31st October, 1840; *Railway Magazine*, 1841, pp. 223 and 224.

§ *Eastern Counties Herald*, 12th November, 1840.

|| *Railway Magazine*, 1841, p. 1053.

¶ Rd. Otley to Jos. Taylor, 25th July, 1834.

** Minutes of Leeds and Selby Railway Company, 7th November, 1834.

†† Half-yearly Report, 14th August, 1841; *Railway Magazine*, 1841, p. 688.



Drawn by R. May.

View of Hartlepool Docks from the South.

from the working of their collieries than from the working of their railway, which for many years did not pay its expenses.* The quantity of coals sold in 1838 was 133,887 tons, and, in 1839, 136,374 tons, the profits being, in 1838, £9,839 and, in 1839, £9,047. In the burning of lime at Stanhope and Annfield the Company consumed nearly 10,000 tons of coals a year. The quantity of lime carried annually down the railway and distributed among the seven depôts was between 9,000 and 10,000 chaldrons.† The manufacture of lime, however, was not a source of profit to the Company, and in 1839 it was discontinued. The docks at Hartlepool proved a valuable property to the Hartlepool Dock and Railway Company. In five years the trade of these docks nearly trebled itself, the increase in the number of vessels entering the harbour and in the quantity of coals shipped being as follows:—

			Ships Entering to Load.		Ships Entering for Refuge.		Coals Shipped.
			No.	Registered Tonnage.	No.	Registered Tonnage.	Tons.
1836	...	...	1,073	126,225	205	15,956	166,396
1840	...	...	2,346	310,968	699	48,572	434,602
Increase	...	...	1,273	184,743	494	32,616	268,206‡

The importation of timber, which now forms so important a part of the trade of the Hartlepoons, began in 1840; in that year 34 cargoes of timber from Canada and the Baltic entered the harbour, the Government duty on which amounted to about £9,000.§



W. Wyom, R.A.

MEDAL USED AS PASS ON NEWCASTLE AND CARLISLE RAILWAY, 1840.

* T. E. Harrison, *Evidence on North-Eastern and Newcastle and Carlisle Amalgamation Bill*, 1860, p. 12.

† Edward Potter, *Evidence on South Durham Railway Bill*, 1836, p. 18.

‡ *Northern Tribune*, 1854, vol. ii., p. 29.

§ Lewis's *Topographical Dictionary*, 1844, vol. ii., p. 422.

(2)

MACHINERY OF TRANSPORT—PERMANENT WAY—STATIONS—METHODS OF WORKING—MANAGEMENT.

Of the nature and extent of the traffic on the early railways, it is now possible to form a good general idea. How this traffic was worked is the next question that suggests itself. Looking at the machinery of transport, we find certain forms of it almost peculiar to the North of England. Especially curious and interesting were the self-acting inclines, some of which, unaltered in design,* though worked by steel instead of hempen ropes, are still in active service, forwarding on their way to the places of shipment over a million tons of coals a year at a comparatively small cost per ton per mile.† There were 17 of these self-acting inclines in 1841, with a total length of 13 miles, namely, on the Stanhope and Tyne Railway 6, on the Brandling Junction 4, on the Hartlepool 2, on the West Durham 2, on the Durham and Sunderland 1, on the Whitby and Pickering 1, on the Stockton and Darlington 1, and on the Seghill 1, 15 of them being worked entirely by gravity and 2 of them partly by gravity and partly by steam power.

No more simple and economical device existed for working a railway with steep gradients than that employed on these self-acting planes. The device was this: to connect a set of loaded waggons at the top of the incline with a set of empty waggons at the bottom by means of a thick rope passing round a large pulley-like wheel at the bank-head and over a number of small sheaves fixed on stands at intervals of 8 yards or more along the line, and then to leave gravity to perform its work under the control of an iron brake applied at need to the upper edge of the nearly horizontal wheel. A self-acting incline presented some peculiarities in the arrangement of the lines. At the bank-head there were three and, in the middle of the incline—where the full and empty sets of waggons passed each other—two. Two lines, formed of three, instead of four rails and, consequently without any inter-

* T. E. Harrison, *Evidence on West Durham and Tyne Railway Bill*, 22nd March, 1886.

† *Railway Magazine*, 1898, p. 527. The working of a self-acting incline at the present day is admirably described and illustrated in the article which contains this statement. The article is from the pen of Mr. Chas. A. Harrison, chief-engineer of the North Eastern Railway.

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Photo by

Crawley Bank from the North.

M. W. Ramsey

mediate space, were required between that part of the incline called "meetings" and the bank-head, because the rope, in this section, passed over two sets of sheaves—upward over one set and downward over the other—but one line sufficed between "meetings" and the foot of the incline for both ascending and descending waggons. The switches worked automatically, one set of waggons throwing them into position for the passage of another. At the top of the incline the empty waggons passed over the "kip," a kind of hump in the line which prevented them from falling back. A great deal of the excess of power acquired by the descending waggons was employed in taking the ascending waggons over the "kip" and, their velocity being reduced by this additional effort, they were the more speedily brought to a standstill. The usual number of chaldron waggons composing a set was 8, but in one case—the Vigo bank—it was customary to run 24 loaded waggons against 24 light ones.* To work a self-acting incline, a brakesman, two bankriders and a sheave-oiler were required.

Besides the rope inclines which were self-acting, there were others of a total length of $42\frac{1}{2}$ miles, worked by stationary engines. These engines, of which there were 30, represented a capital outlay of £100,000, the smaller ones (20 to 52 horsepower) costing, on an average, with engine-house, ropes, etc., about £2,000 each, the larger ones (60 to 120 horsepower) about £4,000. By this system of rope-traction heavy traffic was conveyed generally at a cost of about $\frac{1}{2}$ d. per ton per mile. For some years the Stockton and Darlington Railway Company let the working of the Black Boy incline for 47d. per ton per mile and that of the Brusselton incline for 59d. At these prices parties were found prepared, not only to haul and let down the loaded and empty waggons, but to repair the engines, renew the ropes and uphold the permanent way. While the cost of working the principal self-acting inclines on the Stanhope and Tyne Railway in 1839 was £415 per mile, the cost of working the Durham and Sunderland Railway and the busiest part of the Stanhope and Tyne Railway by stationary engines in the same period was about £485† per mile.

Sixty great ropes, of a total length of 68 miles, were daily travelling over these stationary engine and self-acting inclines at a speed of from 7 to 11 miles an hour with loads of 24, 32, 48 and even 96 tons attached to them. Some of the earlier ones—those originally used on the Stanhope and Tyne

* T. E. Harrison to Chas. Liddell, 15th December, 1841.

† Stanhope and Tyne Books, 1839.

Railway—were of indiarubber solution, a material found to swell and become soft in wet weather, and therefore unfitted to stand the friction on the inclines.* From 1835 to 1841 no other than hempen ropes were used and, as these were occasionally tarred, a smooth and glossy surface was soon formed upon them which diminished the wear from friction. Varying in girth from 4 to 8½ inches and in weight from nearly 2 to 6 tons per mile,



CRAWLEY BANK HEAD.

these ropes rarely lasted longer than 10 months—their average duration was 7 months.† Wire ropes were just coming into use at the close of this period; they appeared on Brandling Junction Railway in June and on the Durham and Sunderland Railway in September, 1841.‡

By means of these stationary engines it was possible to work over the principal inclines from 2,000 to 4,000 tons a day: 67 “runs” of 12 waggons

* T. E. Harrison to Directors of Stanhope and Tyne Railway, 25th February, 1835.

† N. Wood, *Report on Brandling Junction Railway*, Qn. 1,141.

‡ *Report on Brandling Junction Railway*, Appendix, p. 60; *Newcastle Courant*, 2nd August, 1844 (“The Wire Rope Case”).

each, equal to 904 waggons with 2,120 tons of coals, was the greatest quantity of work done in one day by the Brusselton Incline up to September 6th, 1839. But these engines put a limit to the development of traffic on a railway. The power of the "Vigo" engine was the measure of the carrying capacity of the Stanhope and Tyne Railway. In 1837, with waggons at both sides, it was capable of making 4 "runs" an hour with 24 waggons, equal to 1,153 waggons in a day of 12 hours.

The working of a line largely composed of inclines required a great deal of practical knowledge and resourcefulness on the part of the traffic manager. A gale at sea, preventing vessels from coming to the shipping-places, would not infrequently cause an accumulation of loaded waggons at the staiths. As siding accommodation was limited and the present system of sorting by gravitation undeveloped, there was apt to be a congestion of traffic at one part of the line and, for want of empty waggons (without which the self-acting inclines could not act at all), a stoppage of work at another. Strong westerly winds had the effect of delaying the return of the empty waggons on an incline like the Vigo West Bank* where the gradients were not very severe. The collieries, as well as the inclines, were affected by the detention of the empty waggons, being sometimes laid off for a day or more for the want of them. The necessity for the men at the upper part of the line being in touch with the men at the shipping-places was felt at an early period, and the directors of the Stockton and Darlington Railway had actually decided in 1832 to adopt a system of telegraphic signalling between Middlesbrough and the collieries which would have required stations to be erected at Middlesbrough, Great Stainton, and Eldon. "The working of signals three times a day at these stations," it was reported, "would enable the Railway Company to arrest those coals which were not required for immediate shipment at the most convenient places"† and remove a serious cause of detention—the accumulation of loaded waggons near the shipping-places. Lord Eldon objecting to the erection of these signalling stations on his estate, other sites were considered, but, after further negotiations with the landowners, the scheme appears to have fallen through.

In consequence of the congestion of traffic at certain points, it was frequently necessary to work the inclines after dark. The risk to life and property was thereby increased. The men employed on the banks had to perform their tasks by the light of fire-lamps and low-ropes—iron grates

* T. E. Harrison to the Directors of the Stanhope and Tyne Railway, 8th February, 1837.

† Report on causes of delay of full and empty waggons, 3rd August, 1832.

suspended from gibbet-like posts, and torches made of short lengths of old tarred incline-ropes carried about by hand. The difficulties of working by night were sometimes met in an ingenious way. In order to ascertain the position of the waggons on the Etherley inclines, Thomas Greener, the engineman, constructed a small model of the inclines, the working of which corresponded exactly with that of the originals.*

Accidents were unfortunately of frequent occurrence on these inclines. The bursting of a boiler,† the collapsing of a drum,‡ or the breaking of a driving-axle§—accidents like these, causing the stoppage of an engine, meant also the disorganization of the traffic of the whole line. Once a year, in January, when the collieries were laid idle, it was the custom to close the Stanhope and Tyne Railway from end to end for a week in order that the machinery might be thoroughly overhauled.|| The most common form of accident was the “running amain” of the waggons. It was caused in various ways. Ropes broke, couplings gave way, the men at the bank-head, perhaps, omitted to put scotches in the wheels of the waggons and the wind set them in motion,¶ or the bank-riders knocked off the rope before the hinder waggons had got over the “kip” and the force of gravity drew them back together with the rest of the set.** When waggons, from one or other of these causes, got adrift the only thing to do was to throw them off the line at the “runaway” or “safety” switches, which were placed at some convenient part of the incline. The risk of damage from the breaking of the rope was minimized on the Stockton and Darlington Railway by the use of the “cow”—a pronged implement attached to the centre bar of an ascending set.†† While the waggons remained connected with the rope the “cow” trailed passively behind but, as soon as they broke loose, it gripped hold of the ground and either stopped the waggons or threw them off the line. The “cow” was not a novel feature on the northern railways, having been in use at Whitehaven in 1765‡‡ and at Killingworth many years before the

* *A Railway Engineer of 1825* (Thomas Greener), by John Glass, 1875.

† Sunderland Moor engine, 19th September, 1839. ‡ Black Boy engine, 3rd April, 1837.

§ Etherley engine, 26th January, 1831.

|| T. E. Harrison to R. Till, 23rd December, 1843.

¶ Black Boy South Incline, 23rd February, 1832.

** Etherley Incline, 4th January, 1830; Brusselton Incline, 5th January, 1830; Stanley Incline, 24th October, 1839.

†† The form of “cow” used on the Stockton and Darlington Railway appears to have differed from that shown in Mr. O. Hedley’s *Transit of Railway Carriages on Steep Planes*, 1834, pp. 28 and 29, which resembled the back part of a pair of steps.

‡‡ “Il y a un fer fourchu trainant qui se fixe en terre au recul du chariot,” Jars’ *Voyages Métallurgiques*, vol. i., p. 243.

opening of the Stockton and Darlington Railway.* Many an accident was averted by this simple contrivance. On one occasion (29th April, 1835), when the coach from St. Helen's Auckland, was attached to the loaded waggons going up Brusselton West Bank, the rope broke† and, but for the action of the "cow," there would doubtless have been a loss both of life and property. It was probably after 1841 that that simple and effective safeguard placed between the rails at the head of some inclines—the "catch-chock" or "monkey"—which eventually superseded the cow, came into use, one of the earliest being fitted up on the Redheugh Incline.‡

Both audible and visible signals were used in the working of the inclines. The former consisted of bell or rapper at the bank-head connected by a rope or wire with a small drum at the bank-foot. The visible signals consisted, on the Stockton and Darlington Railway, of a disc painted white, mounted on the top of a pole 20 feet high and on the Stanhope and Tyne Railway of two poles, one at the top and the other at the bottom of the incline, connected by a wire. In the one case the signal was given by turning the disc in the direction of the engine, in the other by pulling over the lower pole till it lay nearly flat on the ground, the effect of this movement being to raise the pole at the top of the incline. Signalling blunders led to several mishaps on the inclines.§ On one occasion a set of empty waggons not having run quite far enough into the siding at the foot of Brusselton West Bank, the man stationed there, without turning off the signal board, attached two horses to the waggons to haul them down. The engineman, assuming from the position of the signal that all was right, threw the machinery into gear and "took them away both waggons and horses."|| On another occasion, either the bank-rider at the foot of the Twizell incline had pulled up the signal before attaching the rope to the empty waggons, or some beast had got its leg entangled in the signal cord and raised the post,¶ the brakesman let the loaded waggons away and there was a break-up, the line being wrecked by the lashing of the rope. The men employed on the inclines worked long hours—from 12 to 16 hours a day—and their wages were not extravagantly

* *Summerside's Anecdotes of George Stephenson*, 1878, pp. 16 and 17.

† John Graham's Reports.

‡ "Fitting up checks (? chocks) on Redheugh Incline instead of cows," Report on Brandling Junction Railway—Schedule of Capital Account, H. Y. E., December 31st, 1843.

§ Wm. Hobson's Notes.

|| John Graham's Reports, 10th June, 1835.

¶ This was not an improbable expianation, for Joseph Lucas, reporting the accident to Mr. T. E. Harrison, 25th October, 1839, added, "Twice to-day the signal was pulled up by a cow getting its leg over the signal cord on Eden Hills Incline."

high. The enginemen received from 20s. to 22s. a week (with house and coals), and the firemen (who also assisted in the marshalling and coupling of the waggons) from 15s. to 18s., extra remuneration being given to both for cleaning the boilers. Brakesmen, bank-riders and bank-headmen received from 16s. to 18s. a week and sheave-oilers from 6s. to 9s.*

Incontestably the most important part of the machinery of transport was that supplied by the locomotive engine which presented, during this period, so remarkable a development. By the year 1831 it had passed through the stage of probation, but was still an object of dislike to many of the landowners. In the very district where its power had been so triumphantly demonstrated there were found people not unwilling to throw obstacles in the way of one of the greatest improvements of the century. They brought an indictment against six of the directors of the Company and seven of their enginemen for a nuisance arising from the use of locomotive engines, which exhibited "terrific and alarming appearances" when travelling at night, emitted "unwholesome and offensive smells, smokes and vapours," and made "divers loud explosions, shocks and noises."† These "unusual and appalling noises" had a startling effect on horses. To "Nimrod," who met the locomotive engine when riding on horseback near Yarm on the 14th December, 1827, it had seemed "really a frightful object," and "the noise of the wheels, perhaps 20 pairs, the working of the engine, the blazing fires of blue and yellow hues, the hissing steam, and the black-faced wretches with their red lips and white teeth running to and fro"‡ had produced an impression which could only be described by lurid imagery. Doubts having been expressed whether an impartial jury could be obtained in the County of Durham, the trial of the indictment was held at York on the 30th March, 1821. Evidence was then given, which cannot be read without amusement at the present day, against "those great snorting, roaring and mighty monsters, vomiting fire in all directions, which the horse by no means recognises as cater-cousins or relations of his."§ A toll-keeper, in particular, deposed that the engines made a groaning and coughing noise, but the cough was worse at some times than others, and persons travelling on horses and in gigs had frequently alighted and put their horses into his barn until the engines had passed, and upon these occasions he had seen horses tremble much.||

* W. Mackie to T. E. Harrison, 5th August, 1839.

† Indictment: *Rex v. Pease and others.*

§ *Leeds Intelligencer*, March 31st, 1831.

‡ *Northern Tour*, 1838.

|| *Leeds Mercury*, 2nd April, 1831.

The jury found a special verdict and the case was subsequently argued in the Court of King's Bench, when it was held by the Court that this interference with the rights of the public must be taken to have been contemplated and sanctioned by the Legislature, since the words of the Statute authorising the use of the engines were unqualified. Judgment was given in favour of the Company on the 3rd December, 1832.*

This indictment of the Stockton and Darlington Railway Company was followed in 1835 by the famous injunction against the Newcastle and Carlisle Railway Company, which, it will be remembered, stopped the use of locomotive engines on the line for nearly six weeks, and this injunction in its turn, was followed a few months later, by an action against the Stanhope and Tyne Railway Company resulting in a verdict of £104 for the plaintiff—a wine and spirit merchant of South Shields—for damage alleged to have been sustained, namely:—wine and spirits in his vaults depreciated by the shaking motion or vibration of the engines and their trains—the vaults themselves injured—the ceiling of the rooms in his house cracked—the produce of his garden rendered unhealthy—himself and family annoyed in the day and even unable to sleep in the night from the noise, smoke and obnoxious effluvia arising from the engines.†

At the time of the indictment there were about 50 horses employed on the Stockton and Darlington Railway in leading coals, in addition to 19 locomotive engines, and the Company had some difficulty in regulating the traffic owing to the numerous sets of waggons travelling at a low speed which encumbered the line. The difficulty was partially met by a regulation compelling the horse-leaders to travel in company, at first in sets of five and afterwards in sets of four.‡ This travelling together, however, had its drawbacks. Horses, taking fright at a passing engine, sometimes backed out of their dandy-carts and were run down by the waggons following them and killed.§ Drivers neglected to regulate their speed when going down the “runs” and it sometimes happened that one set of waggons dashed into another with disastrous results to the occupant of the dandy-cart. An accident occurred 4th August, 1831, through “going in fours,” which would not have taken place if the drivers had been travelling separately. As a

* *Leeds Mercury*, 15th October, 1832.

† *Bell v. Harrison and others*, *Durham Advertiser*, 7th August, 1835.

‡ Sub-Committee Minutes, 30th April and 25th June, 1830.

§ An accident of this kind happened at Middridge Lane in May, 1832, and another on Oak Tree Battery in November, 1832.

number of empty waggons, driven by horses, were travelling from Stockton, one of the drivers left his horse and got into the dandy-cart of the set going up before him. There he fell asleep and his horse, no longer urged forward, dropped behind and finally came to a standstill. The "Globe" engine coming up about one o'clock in the morning ran into the standing waggons (which were without a light) and threw them off the line, the traffic in consequence being stopped for two hours.* Regulations might be made, but it was difficult to get the horse-leaders to conform to them. They seemed to have an invincible dislike to taking the siding when met or overtaken by a locomotive engine. Two of the men who left Shildon on the 1st March, 1832, drunk, after driving recklessly along for some miles and committing several breaches of the bye-laws, met the "William IV." engine ascending the line. They refused to go into the siding and not only laid a rail and chair before the engine with the object of throwing it off the line, but got on to the footplate and collared the engineman.† Several others, on the 23rd April, 1832, made the "Rocket" engine follow them from Redhall to Darlington, a distance of over two miles, before they would allow the engine to pass.‡ The horse-leaders were constantly leaving the switches wrong, travelling by night without lights, driving furiously across the roads and lanes (which were unprotected by gates at this time), going down the "runs" at headlong speed, numerous horses being killed and lamed and locomotive engines damaged by these breaches of the bye-laws. Not infrequently they left their horses and waggons standing on the line for a considerable time—two hours in one case—while they were drinking in a public house adjoining the line. On one of these occasions, the "Globe" engine ran into the waggons which were standing without a light at Aycliffe Lane; on another, the coach was stopped for some time at Urray Nook by the obstruction. Two of the leaders on the 30th June, 1832, stopped their horses and waggons at the top of Darlington Run and went into the lane to fight.§

On account of the inconvenience caused by waggons travelling at different rates of speed, the directors decided to adopt locomotive engines exclusively for the haulage, not only of minerals, but of goods and passengers. The private leading of coals had consequently to be given up. From one quarter of the line, there came a rebellious protest, but the Darlington Quakers had "a short and easy method" with recalcitrant colliery managers, as will be seen by the following account of an interview between Edward

* John Graham's Reports.

† *Ibid.*

‡ *Ibid.*

§ *Ibid.*

Pease and the viewer of Butterknowle Colliery. Mr. Pease stated that the Stockton and Darlington Railway Company had adopted a certain system for hauling the coals and they wished to carry it into effect. He said it would be against the interests of the colliery owners to put themselves in opposition to such a powerful body as the Railway Company. He considered the Colliery agents had been "ill-advised" in undertaking the leading themselves, and added that "they had brought such a rod to the back of the owners of the Butterknowle Collieries as they were little aware of."* After that figurative expression there was a gentle intimation that they had better withdraw their horses. The Company got their way, and the Colliery owners did not suffer pecuniarily, seeing that the cost of haulage by their own horses was the same as the Company's charge for this service, viz.: $\frac{1}{2}$ d. per ton per mile. All the efforts of the Company to come to an arrangement with the coach proprietors and the carriers of goods on the railway were for a long time unavailing. A resolution of the General Meeting gave the Committee "the power of inducing" the coach proprietors and carriers of goods "to comply with their wishes."† Arrangements were then made for the withdrawal of horses engaged in the conveyance of passengers and goods and, on the 7th of September, 1833, a service of trains was established between Darlington and Stockton with locomotive engines as the motive power, travelling down the line at the rate of 12 or 14 miles an hour, and stopping only at Fighting Cocks and Yarm Branch end. Goods went in the same train as passengers, not without danger to the latter, for, the waggons having no springs, the goods and side boards were sometimes jolted among the wheels.‡ At the beginning of December, 1833, the locomotive engines began drawing the coach between Shildon and Darlington, though west of Brusselton Hill horses continued to be used. Some delay took place in the substitution of locomotive engines for horses on the Middlesbrough Branch. They began leading coals on that part of the line on the 3rd of February, 1834,§ and passengers and goods on the 7th of April, 1834.|| The regular passenger trains ceased to carry goods in February, 1836, but, attached to the goods train, was a coach "for persons missing the passenger coaches."¶

Though anxious to get rid of horsepower on the railway, the Company would not allow the Clarence Railway Company to haul with their own

* *Minutes of Evidence on Durham South-west Junction Railway Bill*, 1836, p. 49.

† Annual Report, 2nd August, 1833.

‡ John Graham's Reports, 13th September, 1833.

|| *Ibid.*, 11th April, 1834.

§ *Ibid.*, 7th February, 1834.

¶ Handbill dated 1st February, 1836.

engines, from the foot of the Brusselton and Black Boy inclines to Simpaspature, the waggons intended for their own line. On the 12th of September, 1837, the Clarence Company made an attempt to take one of their engines—the “Sir Robert Peel”—from Simpaspature to Shildon, with what success may be seen from the note appended to one of the General Orders authorising the attempt—“Denied entrance by Quakers’ people who pulled up 1 plate.”* The Stockton and Darlington Company afterwards stationed two men at the Clarence branch end to prevent any further attempt of the same kind.†

Steam power was not used on the Clarence Railway before 1835. In that year Mrs. Surtees having assented to the withdrawal of the restriction on the use of this power on the railway in the townships of Mainsforth and Little Chilton, William Hedley, the lessee of Crowtrees Colliery, began leading his own coals by the “Wylam” and “Tyneside” engines. The Clarence Railway Company’s engines began working in 1836. Horses as well as engines were used on the main line between Simpaspature and Port Clarence, and on the Byers Green Branch up to and beyond 1841. Locomotive engines did not travel at all on the Whitby and Pickering and Durham and Sunderland Railways previous to 1841, and they ran on parts only of the Stockton and Darlington, Stanhope and Tyne, Brandling Junction, West Durham and Great North of England, Clarence and Hartlepool Junction Railways.

The structural development of the locomotive engine was a rapid one. Within a little more than five years of the opening of the Stockton and Darlington Railway, the Company were in possession of two small engines of a distinctly modern type—the “Planet” and the “North Star,” built by R. Stephenson and Company, on the plan of the famous “Planet” of the Liverpool and Manchester Railway, which has been described as “the prototype of the modern English locomotive.”‡ They had multitubular boilers, 6 feet 5 inches and 6 feet respectively in length and 2 feet 9 inches in diameter.§ The cylinders were horizontal, placed within the fire-box, those of the “Planet” being 11 inches in diameter with a 16 inches stroke, those of the “North Star” 9 inches in diameter with a similar length of stroke.||

The “Globe,” built by the same manufacturers a few months earlier, from the designs of Timothy Hackworth, marked the first departure of

* Clarence Railway General Order Book, 1st September, 1837; John Graham’s Reports, 15th September, 1837.

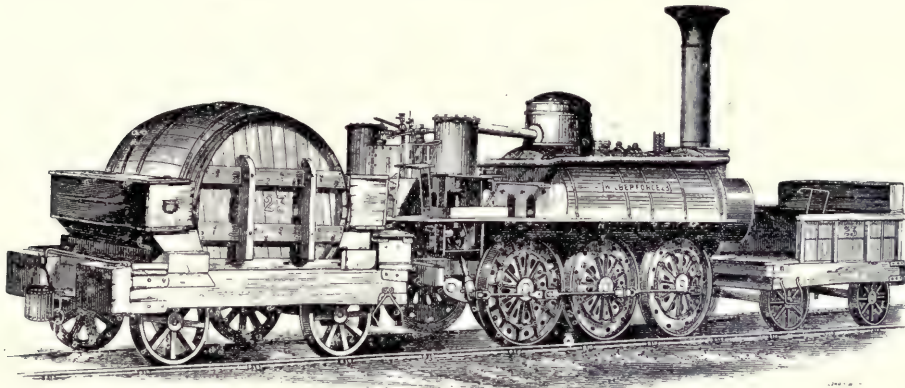
† John Graham’s Reports, 10th November, 1837.

‡ Colburn’s *History of Locomotive Engines*, 1871, vol. i., p. 31.

§ Robert Hawthorn’s *Valuation*, April, 1835.

|| *Ibid.*

the Company from the older type. The boiler (9 feet 3 inches in length, 4 feet in height and 2 feet 8 inches in extreme width)* had a through flue, 2 feet in diameter, with a series of small radiating water tubes across it, behind the fire-bridge. The cylinders (9 inches in diameter and 16 inches stroke) were placed beneath the boiler in a slightly inclined position.† For the idea of the inside cylinders and cranked axles Hackworth and Stephenson as well as Bury were probably indebted to Goldsworthy Gurney, whose steam carriages were at this time being adapted to the railway at Hirwain, by William Crawshay.‡ Hackworth, while retaining the straight flue of an earlier type, followed the example of Gurney in using water tubes



From "The Engineer," October 31st, 1879.

THE "WILBERFORCE" ENGINE.

instead of fire tubes. These water tubes soon became furred up and destroyed, and a shortened flue with 80 fire tubes, 4 feet long, took their place. The weight of these small engines was about 5 or 5½ tons. In 1831 and 1832 the Stockton and Darlington Railway Company added 12 new engines to their stock, 3 of them built by the Company at Shildon, 2 by R. Stephenson and Company and 7 by R. and W. Hawthorn in accordance with plans which Hackworth had submitted as "the best suited to the Company's purpose." These fell into two classes, one known as the "Majestic" class, and the other as the "Wilberforce" class. All these engines had vertical cylinders (14½ inches diameter and 16 inches stroke), which in the first-named class were placed in front of the chimney and in the

* Robert Hawthorn's Valuation, April, 1835.

† J. Dixon's Valuation, July, 1835.

‡ Gordon's *Treatise on Locomotion*, 3rd edition, 1836, pp. 76-78.

second at the opposite end, on a framing projecting 6 feet beyond the boiler. The piston rods were guided by parallel motions, and the connecting rods worked down to independent shafts fitted with cranks from which the power was carried to the wheels by three coupled rods on each side.* The boilers of all the engines of the "Majestic" class, except one, were 13 feet 4 inches in length, and the heating surface in each case was obtained from a flue, 9 feet 2 inches in length and 2 feet 5 inches in diameter, and 104 copper tubes, 4 feet long, extending from a partition plate at the end of the boiler to the smoke-box. The boiler of the "Wilberforce" class was 10 feet 6 inches in length and 4 feet 4 inches in diameter. It had one straight flue about 9 feet long, at one end of it being the fire-grate, and at the other a combustion chamber from which a number of tubes varying from 86 to 104 came back by the sides of the flue to the chimney. The weight of these engines was $10\frac{1}{4}$ tons empty and $11\frac{3}{4}$ tons in working order. There were all spring-mounted, supported on 6 wheels, coupled, these being, each, 4 feet 6 inches in diameter. They all required two tenders, one for water and the other for fuel.

Under the conditions imposed upon them by the Company—a limitation of speed to 6 miles an hour in order to save the wear and tear of the machinery and rails—they did not do more work than engines of a simpler construction. Whilst the largest quantity of work performed in 1833 by one of the costlier engines—the "Earl Grey"—was equal to 276,462 tons carried one mile in 110 days, the work done by the "Victory", an old engine remodelled in 1833, was equal to 349,150 tons carried one mile in 107 days.†

In one week it travelled 840 miles and led 1,383 tons of coals, the gross load being upwards of 2,000 tons.‡ An engine of this early type could not only be built and purchased more cheaply, but it could be worked more economically than one of the later types. The common return-flue, while enabling it to generate sufficient steam for the work required of it, was not so liable to get choked up with soot and dirt§ and, being of malleable iron, did not require to be so frequently renewed, as the small copper tubes of the "Majestic" or "Wilberforce."|| With these considerations before them, the Stockton and Darlington board decided to dispose of some of their "superior proved

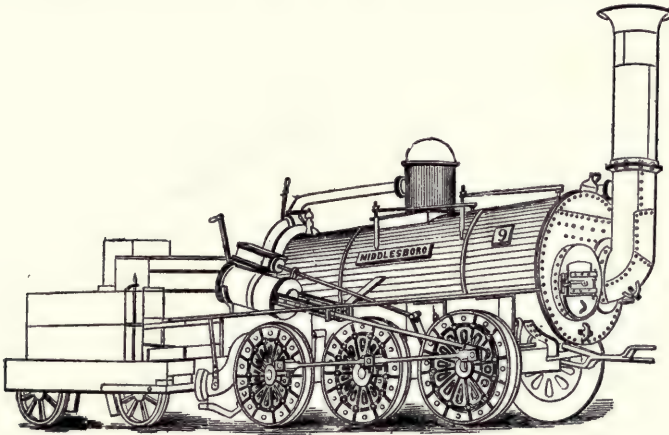
* *Transactions of the Institute of Civil Engineers*, May, 1890, pp. 183-184.

† Wood's *Treatise on Railroads*, 1838, p. 736. ‡ *Durham Advertiser*, 4th October, 1833.

§ On Tuesday, 30th December, 1834, the coach train was an hour-and-a-half in coming from Darlington, the engine ("Earl Grey") could get no steam on account of the small pipes in the tubes being nearly all stopped up with soot and dirt.—John Sidgwick's *Minute Book*.

|| Pambour's *Treatise on Locomotive Engines*, 1836, p. 37; *Minutes of Evidence on South Durham Railway Bill*, 1836, p. 5.

engines"* and replace them by others of an earlier type. Between 1835 and 1838 they purchased four engines, all of which had vertical cylinders and single return-tube boilers supported on six coupled wheels without springs, the "Enterprise"† and "Tees," built by W. and A. Kitching, the first in 1835, the second in 1837, and the "Beehive" and "Briton," built by Timothy Hackworth at the Shildon works in 1838. It was pointed out to the directors that, in adopting this springless type of engine, they had omitted to take into account the greater wear and tear of the rails which it caused, and that the



From "Locomotive Engineering," vol. i., p. 42.

THE "MIDDLESBROUGH" ENGINE.

resultant expense would more than counterbalance the saving in prime cost.‡ Timothy Hackworth then introduced another type of engine with cylinders placed obliquely, that position enabling springs to be used with advantage.

The first engine of this type was the "Tory," delivered in November, 1838.§ It was followed in December, 1838, by the "Whig," built by W. and A. Kitching, and in August, 1839, by the "Auckland," built by Timothy Hackworth, and the "Middlesbrough," built by William Lister. Engines of

* Samuel Barnard to Jos. Gibbs, 4th February, 1837.

† Boiler, 13 feet long and 4 feet 3 inches in diameter; cylinders (vertical), 11½ inches diameter, 20 inches stroke; wheels (6), 4 feet diameter.—J. Dixon's Valuation, 1835.

‡ J. Dixon's Report on Stockton and Darlington Railway, July 25th, 1838.

§ On the 25th of May, 1839, the "Tory" burst her boiler while standing near to Preston Cottages, the tube being blown about 50 yards from the engine.

this type proved very serviceable. In 27 working days (March, 1841) the "Pilot," built by W. and A. Kitching in 1840, travelled 3,712 miles, or $137\frac{1}{2}$ miles per day, and hauled a gross weight of 13,856 tons (coals 6,964 tons, waggons 6,892 tons). The "Middlesbrough" travelled in the same period 3,665 miles, or $135\frac{3}{4}$ miles per day, and hauled a gross load of 12,987 tons (coals 6,542 tons, waggons 6,445 tons).*

The first passenger engines were the "Planet," the "North Star" and the "Globe," together with the "Shildon," the "Wilberforce" and, after July 15th, 1835, the "Magnet." Other engines used in 1836 and 1837 were the "Swift," the "Sunbeam" and the "Arrow." The "Swift," a four-wheeled engine built by R. and W. Hawthorn in 1836, was a variation of the "Wilberforce" class, the vertical cylinders (10 inches diameter and 18 inches stroke) being placed midway along the boiler and projecting partly above it and working downwards to an independent shaft between the coupled driving-wheels. It weighed only $7\frac{3}{4}$ tons.† The "Sunbeam" was a four-wheeled engine built by R. and W. Hawthorn in 1837, with inside cylinders (12 inches diameter and 18 inches stroke), multitubular boiler and a single pair of driving-wheels 5 feet in diameter, weight 10 tons 14 cwt. The "Arrow," built by Timothy Hackworth at the Soho works, Shildon, was a six-wheeled engine, 13 tons 14 cwt. in weight, with some peculiarities of construction: it had inside cylinders, and while the diameter of these was 22 inches, the stroke was only 9 inches. "It was supplied with a cross-shaft, on which were hung two solid cast-iron wheels. To each end of this shaft a lever was attached, by which the driver and fireman could pull down the solid or friction wheels between the periphery of the driving and trailing wheels, thus temporarily connecting by friction the large drivers and the small trailing wheels: in other words, converting a single engine into a coupled one, when needed by greasy wheels."‡ It was tried in May, 1837, but the results were not satisfactory, and it was not until a year afterwards that the engine was passed and taken over by the Company.

By the beginning of 1838, three of the earlier passenger engines had disappeared from the line. The "Planet," which had been chiefly employed on the Middlesbrough branch, and the "Shildon," which ran between Shildon and Darlington, were sold to contractors on the Great North of England

* *Sunderland Herald*, 30th April, 1841.

† *The Locomotive*, November, 1902, p. 184.

‡ *Proc. Inst. Mech. Eng.*, May, 1890, p. 186.

Railway. The "North Star" was made into a pumping engine, the "Globe" burst her boiler at the Middlesbrough Coach Station just after arriving with a train from Stockton on the 18th January, 1838.* The engines which took their place were supplied in the following order:—The "Queen," by W. and A. Kitching, in November, 1838; the "London," by John Hague, in July, 1839; the "Raby Castle," by W. and A. Kitching, in October, 1839; and the "Dart," by Timothy Hackworth, in April, 1840. All these engines had inside cylinders, those of the "Queen" (which were below the axles and inclined slightly upwards) being 12 inches in diameter, those of the "Raby Castle" 12 inches, those of the "London" 11 inches, and those of the "Dart" 13 inches. The piston-stroke of the "Queen" and the "Raby Castle" was 18 inches and of the "London" and the "Dart" 16 inches. The "Raby Castle" was a six-wheeled engine having a single pair of drivers, 5 feet in diameter.† The other three engines had originally four wheels, coupled. Most of the engines running on the Clarence and Hartlepool Railways were of similar construction to those used on the Stockton and Darlington Railway. On the Clarence Railway there was one at least of a different type built by Hackworth and Downing, of Shildon. With a common return-tube boiler, it had horizontal cylinders (diameter, 13 or 14 inches; stroke, 20 or 22 inches), which were placed outside.‡ The engines employed in hauling the coaches on this line—they belonged to the lessee of the passenger traffic—were the "Victory" and the "Norton," the former, built by William Lister, of Darlington, having vertical cylinders (diameter, 13 inches; stroke, 18 inches), one large fire-tube and 75 small tubes and 4 wheels, coupled, the latter, built by R. and W. Hawthorn, having horizontal cylinders (diameter, 14 inches; stroke, 15 inches), 135 tubes and 4 wheels, coupled. The Stockton and Darlington, the Clarence and the Hartlepool Railways were the only railways in the North of England which employed, even for the haulage of minerals, locomotive engines built on a different plan from that laid down by the Stephensons in 1830.

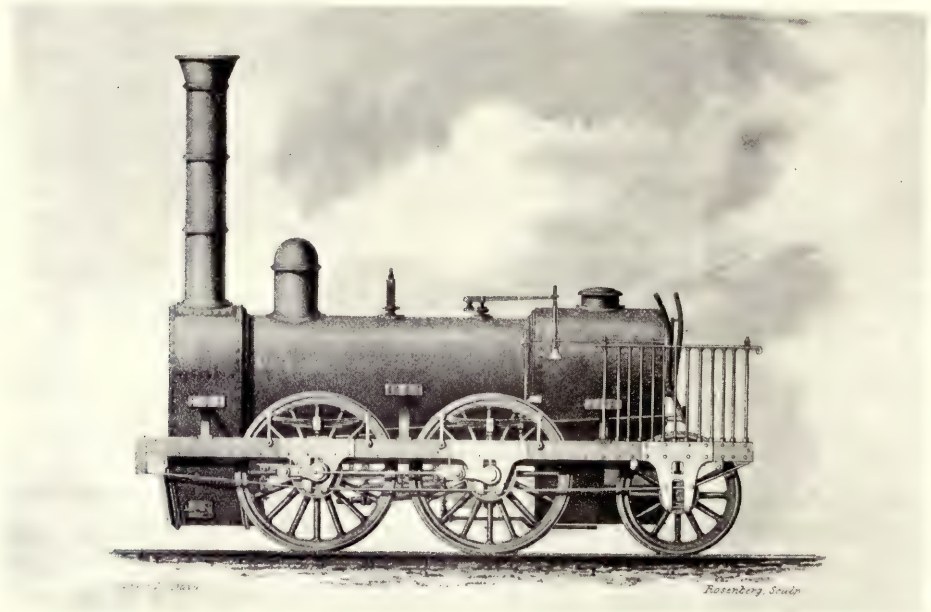
Most of the engines used on the Leeds and Selby Railway were supplied by Edward Bury, of Liverpool. They had round fire-boxes, inside cylinders, 11 and 12 inches in diameter, with a stroke of 18 inches, and inside frames,

* *Sunderland Herald*, 26th January, 1838.

† "The 'Raby Castle,'" wrote Mr. Herapath in 1841, "was a beautiful little engine for her size and weight, and second to none that I have yet seen. She was a steady, active, neat, tight little engine, and capable of generating much more steam than she had weight to apply it to."⁵—*Herapath's Journal*, 1841, p. 1075.

‡ *Proc. Inst. Mech. Eng.* May, 1890, p. 190.

and they ran on four uncoupled wheels, the drivers being 5 feet in diameter. These early Bury engines had only a short term of service on the Leeds and Selby Railway. Having been found too light for the work required of them, they were sold—the “St. Vincent,” in 1838, to the Newcastle and North Shields Railway Company and others—the “Lord Hood,” the “Exmouth,” and the “Rodney” in 1840—to the Hartlepool Dock and Railway Company, who, at the same time, purchased the “St. Vincent” from the Newcastle and North Shields Railway Company. The later engines of the Leeds and



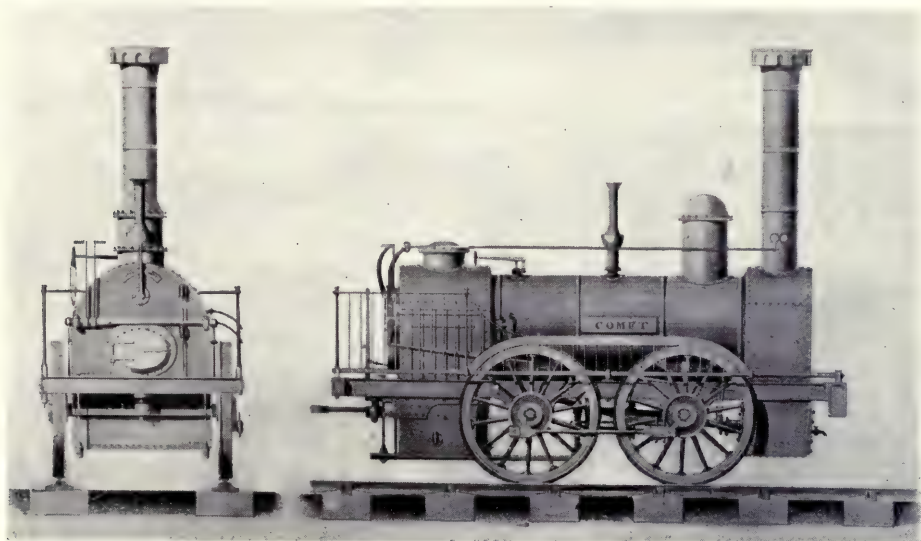
From "Public Works of Great Britain," 1838.

STANHOPE AND TYNE ENGINE.

Selby Company were made by Fenton, Murray and Jackson, of Leeds, and Kirtley and Company, of Warrington. With one exception, the “Thomas Newcomen,” which was originally mounted on four uncoupled wheels, the locomotive stock of the Stanhope and Tyne Dock Railway Company consisted of six-wheeled engines, their principal dimensions being: boilers (multi-tubular) 8 feet by $3\frac{1}{2}$ feet, cylinders (inside) 14 inches by 18 inches, wheels (driving) $4\frac{1}{2}$ feet diameter, trailing, $3\frac{1}{2}$ feet diameter, and their weight in working trim nearly 12 tons. Eight of them were built by R. Stephenson

and Company, the rest by R. and W. Hawthorn, Tayleur and Company, Longridge and Company, Hackworth and Downing, and the Company itself.

Some of the best of the locomotive engines, built between 1835 and 1841, were to be found on the Newcastle and Carlisle Railway. They had to run a comparatively long distance at a fairly good speed. Writing of this railway in 1840, Mr. Whishaw expressed the opinion that "60 miles was evidently too long a length for one engine to travel without undergoing examination,"* yet the journey was being made regularly at this time by the



From "Public Works of Great Britain" 1838.

THE "COMET" ENGINE.

engines attached to the "quick trains." The first engine placed on the line, the "Comet," a four-wheeled engine with boiler 7 feet 6 inches in length and 3 feet in diameter, marked an advance in locomotive construction, being furnished with Hawthorn's valve gear, which was worked by four fixed, instead of two loose, eccentrics.† In the "Tyne," another four-wheeled engine, which ran its first trip on the 13th October, 1836,‡ Messrs. R. and W. Hawthorn introduced further improvements in the hand-gearing for working the slide-valves. The heavier traffic on the line was worked by six-wheeled engines. These comprised some interesting examples of loco-

* Whishaw's *Railways of Great Britain*, 1842, p. 346.

† Simms' *Public Works of Great Britain*, 1838, pp. 69 and 70.

‡ *Tyne Mercury*, 18th October, 1836.

motive design from the "Samson" and "Goliath," of R. and W. Hawthorn and the "Atlas," of R. Stephenson and Company, delivered in 1836, to the "Matthew Plummer," of Thompson Brothers, of Wylam, which, conspicuous with tall brass chimney, began its career in 1840. The swiftest engine on the line was the "Victoria," built by Hawks and Thompson, of Gateshead, in 1838, which had wheels of a diameter unusual on narrow gauge railways at this time, viz., 6 feet, four of them being coupled.

The engines of the Brandling Junction, Newcastle and North Shields, Great North of England, Hull and Selby, Stockton, and Hartlepool and York and North Midland Railways—between 60 and 70 in number—were all of the six-wheeled type with inside cylinders, some having the whole of the wheels coupled, others four of them coupled, and a third group single driving wheels, $5\frac{1}{2}$ and 6 feet in diameter, placed between two pairs of carrying wheels. Fifty per cent. of them were built by R. and W. Hawthorn and R. Stephenson and Company, the remainder by Tayleur and Company, of Warrington; Longridge and Company, of Bedlington, Rothwell and Company, of Bolton; and several other less known firms. Among the more noticeable of these engines were the "Star" and "Vesta," of the Hull and Selby Railway, designed by John Gray, and fitted with his variable expansive valve-gear, the "Exmouth," of the Newcastle and North Shields Railway, and the "Ouse," of the Great North of England Railway, embodying improvements patented by Messrs. R. and W. Hawthorn for generating steam, and the "Prince of Wales," of the York and North Midland Railway—the first of Robert Stephenson's "long-boiler" engines, which marked an important change in locomotive design.

Few of the early locomotive engines have been represented in colour. The Stockton and Darlington engines were painted in 1837 in the following manner: cleading, green; hoops, black; wheels, black and relieved with red; all ironwork, except what was polished, black; tenders, blue, and hoops and ironwork, black.† Brown or maroon appears to have been the colour of the Newcastle and Carlisle engines‡ and also of the Brandling Junction engines.§ The Stanhope and Tyne engines are stated to have been painted

* The length of the boiler, including fire and smoke boxes, was 17 feet, the total heating surface being 795 feet. The weight of the engine in working order was 15 tons. With a train of five loaded carriages it is stated to have attained on one of its journeys a uniform speed for several miles of 48 miles an hour (see *Railway Times*, 1842, p. 389).

† Wilson's tender to paint engines and tenders, May, 1837.

‡ *Newcastle Weekly Chronicle*, 12th March, 1898.

§ Jos. Stephenson's Notes. One of these engines, the "Brandling," according to Mr. Tennant, speaking on the occasion of a presentation to Mr. Ed. Fletcher, 20th July, 1872, was painted red.

MINERAL ENGINES.

PASSENGER ENGINES.††

†† Compiled from accounts of "Practical Railway Experiments" (1839) in Whishaw's *Railways of Great Britain*, 1842, p. 460-478.

These were, of course, the ordinary day by day performances of the engines. On occasion, they were capable of travelling with much heavier loads and at much higher speeds. They are recorded to have hauled as many as 50 waggons on the Stockton and Darlington Railway,* 72 on the Stanhope and Tyne Railway,† 73 and even 100§ on the Newcastle and Carlisle Railway, the gross loads—including weight of engine and trucks—being 230, 316, 330 and 450 tons. In 1841 some of the Stockton and Darlington engines had their ordinary load increased to 36 waggons, and others to 40 waggons, the erection of a water station at the Yarm branch end having enabled them to dispense with one of their water barrels.‖ According to Joseph Pease, a speed of 60 miles an hour had on one occasion been attained on the Stockton and Darlington Railway previous to November, 1835.¶ The “Eden” engine travelled at the same rate on the Newcastle and Carlisle Railway between Milton and Carlisle on the 15th April, 1837.** The average speed of the express trains on the Newcastle and Shields Railway in 1841 was from 31 to 34 miles per hour.††

Up to 1833 the cost of locomotive power on the lines which had as much work to do in the haulage of empty waggons as in the conveyance of goods was nearly $\frac{1}{2}$ d. per ton per mile. In 1841 this cost had been reduced to less than $\frac{1}{4}$ d., a result achieved by the Stockton and Darlington Railway Company in “trying experiments for the world,” to quote a phrase from the report of 1840. We have already seen how the Company contracted with the enginemmen to work the engines at so much per ton per mile. In 1840 they let the haulage by contract to three different parties for 4d. per ton per mile, a sum which may be divided as follows:—Working expenses (wages and consumable articles), 175d.; repairs, 120d.; interest on value of stock and rent of shops, etc., 030d.; miscellaneous expenses and profits, 075d.‡‡

* *Durham Advertiser*, 5th July, 1833.

† *Wood's Treatise on Railroads*, 1838, p. 476.

‡ *Carlisle Patriot*, 13th May, 1837.

§ *Carlisle Journal*, 8th July, 1837.

‖ *Sub-Committee Minutes*, 18th June, 1841.

¶ “The English farmers,” said Joseph Pease, speaking at Newcastle, 17th November, 1835, “would have no reason to dread competition when they were able to travel from Northumberland and Durham to London in the space of seven or eight hours. (Laughter.) This might seem something like an exaggeration, but he could assure the company that a tipsy engineman had run at the rate of 60 miles an hour on the Stockton and Darlington Railway without damage, and that on the Liverpool and Manchester line, some accident having delayed the engine, the engineman said he must make up his lost time, and completed his first mile in fifty seconds, his second in fifty seconds, and the five miles he had to go in less than five minutes.”—*Tyne Mercury*, 24th November, 1835.

** *Carlisle Patriot*, 22nd April, 1837.

†† *Report on Atmospheric Railways*, 1845, Qn. 1043.

‡‡ Based on analysis of contract-price in *Lecount's Treatise on Railways*, 1839, p. 233.

In 1836 the contract price was reduced from 40d. to 34d. per ton per mile.* The arrangement, evidently a profitable one to the contractors, was not continued beyond the 1st March, 1837, on which date the Company took the working of the engines into their own hands again. The cost of haulage on the Stockton and Darlington Railway for the year ending 30th June, 1839, was 24d. (working expenses, 14d.; repairs, 10d.)† On the Stanhope and Tyne Railway the cost for 1839 was 314d. The Clarence Railway Company paid their engine drivers 1875d. per ton per mile for all coals conveyed on the railway, the drivers providing firemen and finding coals, fire-bars, oil, lamps, etc., and the Company keeping the engines in repair.‡ In 1841 the Stockton and Darlington Company made a similar arrangement with their engine drivers but for 1125d. per ton per mile.§ The most variable item of expenditure was that of repairs which, on the Stanhope and Tyne Railway over a period of seven years (1835-41) averaged 5½d. per mile or 15d. per ton per mile,|| and on the Stockton and Darlington Railway for the year ending 30th June, 1839, 5d. per mile or 14d. per ton per mile.¶ The fuel consumed on the Stockton and Darlington Railway by the mineral engines was about 54 lbs. per mile or 86 lb. per ton gross per mile.** On the Stanhope and Tyne Railway the quantity of fuel supplied to the engines in 1835 was: coke 9 lbs., coal 78 lbs.=87 lbs. per mile; in 1836: coke 17 lbs., coal 62 lbs.=79 lbs. per mile, but as a fourth part of the coal supplied was dust which the enginemmen were allowed to throw out upon the line, the actual consumption of fuel in 1835 was 65 lbs., and in 1836 59 lbs., or about 85 lb. per ton gross per mile.†† The passenger engines burnt from 35 to 38 lb. per ton mile‡‡ until 1840, when by generating the steam on an improved plan and working it expansively, the consumption of fuel was very much reduced—on the Newcastle and North Shields Railway from 36·29 lbs. per mile (“Collingwood”) to 25·56 lbs. (“Exmouth”) or from 87 lb. per ton per mile to 59 lb.§§ and on the Hull and Selby Railway from 33·60 lbs. per mile (“Collingwood,” “Andrew Marvell” and “Wellington”) to 14·90 lbs. (“Star”

* Wood's *Treatise on Railways*, 1838, p. 737.

† *The Engineer*, 1879, p. 461.

‡ Whishaw's *Railways of Great Britain*, 1842, p. 62. § Committee Minutes, 7th May, 1841.

|| Report on Rolling Stock, by T. E. Harrison, 20th July, 1849.

¶ *The Engineer*, 1879, p. 461. ** Pambour's *Treatise on Locomotive Engines*, 1836, p. 349.

†† Wood's *Treatise on Railroads*, 1838, p. 546.

‡‡ Whishaw's *Railways of Great Britain*, 1842, p. 359; *Minutes of Evidence on Atmospheric Railways*, 1845, p. 88.

§§ *Mechanics Magazine*, 1840, pp. 716-717.

and "Vesta") or from '84 lb. per ton per mile to '37 lb.* Two of the Companies, the Newcastle and Carlisle from 1839 and the Brandling Junction from 1841 made their own coke, the former having 20 coke ovens at Derwenthaugh,† and the latter 20 near their Hillgate wharf at Gateshead.‡ A feature of some of the early locomotive engines, especially of those with return tube boilers and narrow blast-pipes was the cowl or wire gauze cap on the chimney to prevent the escape of red-hot cinders. These cinders caused a great deal of damage. They set fire to the fore part of the Shildon coach on the 2nd January, 1834§ and to a goods train on the Middlesbrough Branch on the 16th June, 1840,|| and to nearly every plantation along the line at one time or another. On the Hartlepool and the Clarence Railways, where similar engines were used, plantations were fired and goods burnt. The cowls had little effect when the engine was "hard-fired and going quickly," and the Stockton and Darlington Company found it necessary to reduce the speed of the engines to 5 miles an hour when passing a plantation and to have the firemen posted on the last waggon at these points to ascertain that no damage had been done.¶ These cowls were used for a time on the Newcastle and Carlisle line, but afterwards discontinued as useless.** The remedy adopted after some bales of goods had been burnt on this line in 1840 was a screen for the fire-box.††

Brakes were not fitted to any of the engines of this period. Some of the tenders were equipped with them, but not the tenders of the type used generally on the Stockton and Darlington line. The only way of controlling the trains down the banks on this line was to put the engines out of gear and let down the waggon brakes. As there was no guard, the duty of braking and unbraking the waggons fell to the fireman who afterwards regained his post on the engine by walking along the top of the coals from waggon

* *Railway Magazine*, 1841, p. 1062. To show the results of the Newcastle and North Shields and Hull and Selby experiments in a uniform manner, it has been necessary to omit the weight of the engine from the average gross load of the Hull and Selby engines and alter the figures under the head of coke used per ton per mile.

† Whishaw's *Railways of Great Britain*, 1842, p. 347.

‡ *Report on Affairs of Brandling Junction Railway*—Appendix, p. 42.

§ John Graham's Reports.

|| *Sunderland Herald*, 19th June, 1840. As a barrel of gunpowder formed part of the contents of one of the waggons, the consequences of the fire might have been very serious. The barrel actually caught fire and a bystander extinguished the flames without having any suspicion of the risk which he ran. Owing to the bursting of some casks of spirits, nearly the whole of the goods, including a valuable picture belonging to the Bishop of Durham, were consumed.

¶ John Graham's Reports, 10th May, 1833.

** Whishaw's *Analysis of Railways*, 1837, p. 271. †† Lowry's *Diary*, 1st September, 1840.

to waggon.* An engine on the Newcastle and Carlisle Railway is stated to have had two besoms tied to it, on the 29th October, 1836, to sweep the snow from the rails.† The following year William Hawthorn brought out his "railway engine protector" to clear the rails from obstructions, and in 1840 all the engines of the Newcastle and Carlisle Railway are stated to have had ploughs in front of the fore-wheels.‡ The first experiment with sanding apparatus for producing friction, it may be observed, was made on the Newcastle and Carlisle Railway.§



G. Dodgson, del.

J. T. Wilmore, sc.

WHITBY AND PICKERING COACH IN NEWTON DALE.

Let us now turn from the early locomotive engines to the vehicles which were used for the conveyance of passengers on the older lines of the North Eastern Railway between 1831 and 1841. Up to the middle of 1834, the only vehicles used were the old stage-coaches mounted on railway wheels. These links with a picturesque past and the coaches of similar construction built for the Hartlepool and Whitby and Pickering Railways were still running in 1841, some of them drawn by horses, others by locomotive engines. Rail-

* *Proc. Inst. Mech. Engineers*, 1890, p. 178.

† Lowry's Diary, 29th October, 1836.

‡ Whishaw's *Railways of Great Britain*, 1842, p. 346.§ *Newcastle Journal*, June, 1838.

way carriages of the type introduced by the Liverpool and Manchester Railway appeared on the Stockton and Darlington and Leeds and Selby Railways in the latter part of 1834. Between 1834 and 1839 there were three kinds of carriages in use—first-class, second-class, and mixed or composite, besides a few luggage carriages or goods vans with outside seats. The first-class carriages, each designed to carry 18 passengers, had drab cloth linings, stuffed backs and seats, mahogany arm-rests and plate-glass windows; the second-class, with accommodation for 24 or 30 passengers, were neither glazed nor upholstered, but some of them—on the Newcastle and North Shields line, for instance—had curtains at the sides, and others—on the Durham and Sunderland line—movable shutters on one side; the mixed carriages had the middle compartment fitted up for first-class passengers and the other two compartments for second-class passengers. Some of the covered carriages had seats on the roofs. When placed at the ends of the carriages they were dangerous places, and one writer suggested that a netting should always be hooked between each carriage just under the footboard to prevent passengers from being thrown under the wheels.* Had such a safeguard been used on the Stockton and Darlington Railway, a third-class passenger who fell from a luggage carriage on the 24th November, 1840, would have escaped frightful injuries.† The Newcastle and Carlisle Railway Company had benches placed lengthwise on the roofs of some of their carriages for the accommodation of passengers desiring to look about them,‡ but, as Sir George Head observed, “the curiosity once gratified in this respect, he certainly consults economy rather than taste who repeats the experiment, for it is impossible, owing to the rapid motion and the smoke and cinders which fly backwards from the engine to open more than a quarter of an eye at any one instant of time during the whole journey.”§ On the Stockton and Darlington Railway—where the fuel consumed was chiefly coal—the discomforts of outside passengers must have been very great. One report speaks of the “Swift” engine “throwing fire into the ‘Tourist’ coach.”|| It had previously been found necessary to have wire gauze screens fixed to the ends of open carriages for the protection of passengers.¶ The third-class carriages of 1835, we have seen, were trucks with seats in them. Those which began

* Lecount's *Treatise on Railways*, 1839, p. 141. † Police Reports (S. & D. R.), 1840-1842.

‡ The Marquis of Londonderry, travelling to Carlisle with his suite on the 6th September, 1837, occupied an outside seat—for a portion of the journey at least (Lowry's Diary).

§ *Home Tour*, vol. i., pp. 339 and 340.

|| Stockton and Darlington Minutes, 4th November, 1836.

¶ *Ibid.*, 15th May, 1835.

running on the York and North Midland Railway in 1839 are described as "altogether open, but furnished very properly with seats . . . ranged lengthwise, four to each carriage."* Similar carriages were used on the Hull and Selby Railway. The feat of some passengers at Milford South Junction in "getting over the doors without opening them,"† when threatened with a collision, does not seem so surprising when it is remembered that low doors were characteristic features of both second and third-class carriages at this time. The earliest third-class carriage of the Newcastle and North Shields Railway was a large carriage-truck to carry 60 passengers. It was 20 feet 8 inches in length and 7 feet 9 inches in breadth with 10 seats arranged in char-à-banc fashion without doors.‡ Some of the later carriages had canopy tops. One form of third-class carriage had no place on the early lines of the North Eastern Railway; this was the notorious "Stanhope," a mere open box without seats in which passengers travelled, 60 of them together sometimes, with less comfort than animals. Goods trucks and even cattle trucks were occasionally used on busy days, but they were always provided with movable seats. One reads of second-class passengers on other railways catching cold from the currents of air playing about their feet, due to the perforations in the flooring made to let out the rain, but if any of the passengers on the early lines of the North Eastern Railway were similarly inconvenienced there is no record of the fact. One point on which the Stockton and Darlington Board insisted when ordering some new third as well as first and second-class carriages was that "with these and all other coaches on the line great care be taken to make air-tight at the bottom."§

Most of the early carriages had names which gave them a certain picturesque distinction. Among these may be instanced the "Earl Grey," "Victoria" and "Albert" of the Stockton and Darlington Railway; the "Diana," "Ceres" and "Juno" of the Leeds and Selby Railway; the "Expedition," "Despatch" and "Transit" of the Newcastle and Carlisle Railway; the "Times," "Herald" and "Director" of the Newcastle and North Shields Railway; and the "Lady Hilda" and "Premier" of the Whitby and Pickering Railway. There was no lack of variety in the colours of the early carrying stock. The first carriages of the Stockton and Darlington Railway Company were painted a dark blue outside and a light

* Whishaw's *Railways of Great Britain*, 1842, p. 442.

† *Railroad Quarterly Journal*, vol. i., p. 75.

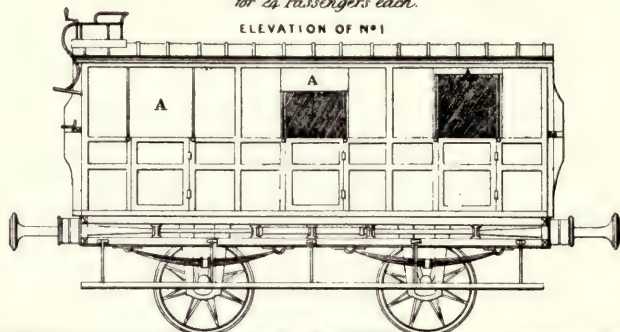
‡ Atkinson & Philipson's Books, 1840.

§ Committee Minutes, 20th December, 1839.

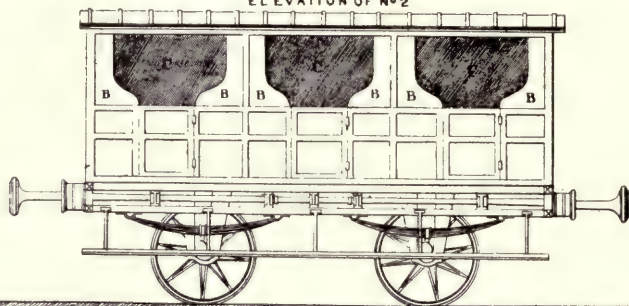
NEWCASTLE UPON TYNE & NORTH SHIELDS RAILWAY.

*Third Class Parliamentary Carriages of two Sorts.
for 24 Passengers each.*

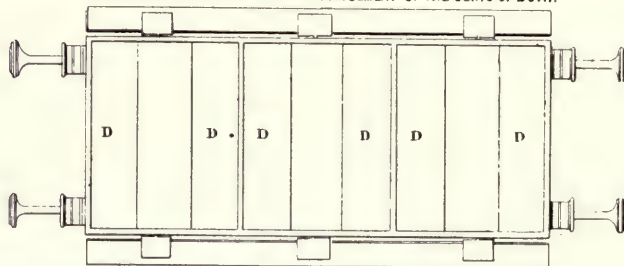
ELEVATION OF N°1



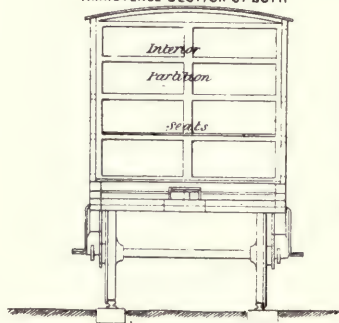
ELEVATION OF N°2



INSIDE PLAN SHEWING THE ARRANGEMENT OF THE SEATS OF BOTH.



TRANSVERSE SECTION OF BOTH



REFERENCES

- To Carriage No. 1
- AAA Transparent Canvas Blinds
- To Carriage No. 2
- BBB &c Wooden side Brackets to shelter the Passengers from the Weather
- CCC Openings not provided with Blinds To Plan
- DDD &c Seats for 4 Passengers each

Scale of Feet



drab inside; then several "green coaches" appeared on the line. In 1841 the colour of the earriages was yellow.* This was also the colour of the Leeds and Selby and Stockton and Hartlepool carriages.† The first-class carriages of the Newcastle and Carlisle Railway, before 1841, were painted yellow picked out with black, and the second-class carriages green picked out with white.‡ In 1843, however, first-class carriages painted claret and picked out with black and second-class carriages also painted claret but picked out with white and edged yellow, appeared on the line.§ The colour of the Brandling Junction carriages was, according to Whishaw, "bright yellow"; some of them, however, were painted drab.|| The carriages of the Newcastle and North Shields Railway were at first painted in the following colours: - first-class, crimson, maroon, and in one case "a rich light scarlet claret edged with yellow"; second-class, drab and vermilion; and third-class, light green¶ but at a later date than 1841 the colour of the first-class carriages was altered to red and that of the second class to claret.** Dark green was the colour of the York and North Midland and Hull and Selby carriages, which struck some passengers as sombre-looking beside the more gaily-painted carriages of other railways.††

In addition to the names which were painted on the carriages there were usually armorial bearings. The Newcastle and Carlisle carriages bore emblazoned on their panels the arms of Newcastle and Carlisle, those of the Great North of England Railway the arms of Newcastle, Durham and York, and those of the York and North Midland Railway the arms of the city of York. The "Victoria" and the "British Queen" of the Newcastle and North Shields Railway as well as the carriages employed for the conveyance of the mails displayed the royal arms. One of the carriages of the Great North of England Railway, afterwards sold to the Stockton and Darlington Railway, had the northern eagle painted black upon it, due probably to the fact that the carriages came from the same manufactory as the splendid state carriage of the Czar of Russia. The Newcastle and North Shields Railway had its "picture-train" more than 60 years before it

* On the 18th February, 1842, it was decided to alter the colour of all the carriages from yellow to lake (Committee Minutes).

† Leeds and Selby Minutes, 14th March, 1834; Atkinson & Philipson's Books, 1841.

‡ Whishaw's *Railways of Great Britain*, 1842, p. 344; Atkinson & Philipson's Books.

§ Atkinson & Philipson's Books, 1843.

|| *Ibid.*, 1839.

¶ Minutes of Newcastle and North Shields Railway, 8th January, 1838; Atkinson & Philipson's Books, 1839-1840.

** Minutes of Newcastle and North Shields Railway, 16th December, 1843.

†† York and North Midland Minutes, 20th September, 1838; Hull and Selby Minutes, 25th May, 1839; *Youth's Instructor*, 1842, p. 306.

occurred to M. Edouard Cros to facilitate the identification of carriages on the Western Railway of France by means of familiar objects instead of numbers. One first-class carriage running between Newcastle and North Shields had four chamois painted upon it (on the doors of the end compartments), another four gazelles, a third four antelopes, and a fourth four reindeer,* illustrations one may call them of the respective names of the carriages. A more utilitarian device appeared on some of the earlier carriages of this railway, the amount of the fare, 1s., on the panels of the first-class, and 6d. on those of the second-class carriages.† In 1834 the price paid by the Leeds and Selby Railway Company for a first-class carriage was £210, and for a second-class carriage £85. Carriages built, five or six years later, for the Stockton and Darlington Railway cost from £250 to £259 first-class, and from £130 to £135 second-class, but those built about the same time for other north-country railways more dependent on passengers for their revenue than the Stockton and Darlington line, £330, £335, £372 and £385 first-class; and £170, £175 and £192 second-class. The second-class carriages on the York and North Midland Railway, which were in four compartments, cost £275. The early third-class carriages of the York and North Midland Railway—made by the Company themselves—with accommodation for 32 passengers, cost about £60 or £63. In 1840 the cost of a third-class carriage was from £100 to £105.‡

The waggons used during this period were reducible to a very few types. Coals were almost invariably carried in chaldron waggons of the well-known shape; measuring 8 feet by 6 feet at the top and 4 feet by 4 feet at the bottom and weighing from 28 cwts. to 32 cwts. on the principal mineral lines. Goods travelled in low-sided trucks weighing from 31 to 42 cwts. and measuring 10 feet or 10 feet 6 inches in length and 7 feet 1 inch or 7 feet 6 inches in width. A somewhat peculiar type of horse-box was in use on the Leeds and Selby Railway, a box it really was, with accommodation for a single horse, 8 feet in length, 3 feet 1½ inches in width and 4 feet 9 inches in height, carried on an ordinary-sized truck. The horse-boxes of the Newcastle and Carlisle Railway were constructed to hold two horses each, those of the York and North Midland three.§

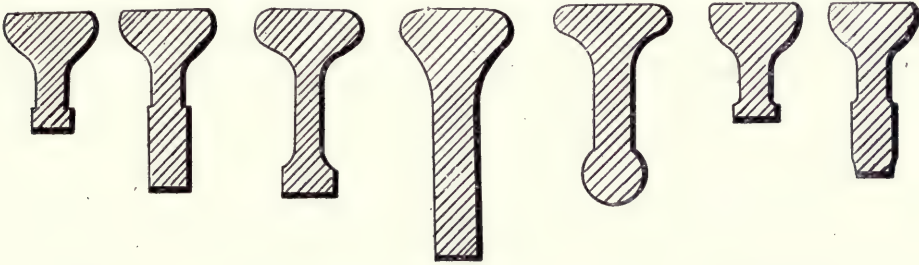
* Atkinson & Philipson's Books.

† Whishaw's *Railways of Great Britain*, p. 358.

‡ Leeds and Selby, Stockton and Darlington, Newcastle, North Shields and Brandling Junction, Hull and Selby, and York and North Midland Railway Books; Atkinson & Philipson's Books; Whishaw's *Railways of Great Britain*.

§ Whishaw's *Railways of Great Britain*, 1842, pp. 180, 345 and 442.

The development of the machinery of transport was not more marked than the development of the permanent way. When six-wheeled engines with their greater adhesion began running on the Stockton and Darlington Railway the original rails were found to be too light for them. From that time to 1836 every new line that was opened had heavier rails than its predecessor. The rails of 1830-2 weighed 32 or 33 lbs. to the yard, those of 1833-5 $36\frac{1}{2}$ (nominally 35) and 40-42 lbs. For several years 40 lbs., or 42 lbs. was the standard weight of the rails employed on most of the railways in the north of England. They were of excellent quality, rolled principally at Bedlington and Walker in Northumberland, Capponfield in Staffordshire and Dowlais, Ebbw and Nantyglo in South Wales.



STANHOPE

LEEDS & SELBY

WHITBY & PICKERING

CLARENCE

DARLINGTON

From "*Public Works of Great Britain*," 1838.

SECTIONS OF RAILS USED ON EARLY LINES.

The heavier rails of a later period, wrote Mr. T. E. Harrison in 1849, "were not to be compared with them."* In the case of one railway—the Durham Junction—the manufacturers guaranteed to replace all rails that failed within four years.† About 1837 when the Stockton and Darlington Company abandoned the "fish-bellied" for the "double parallel" form, the weight was increased to 50 lbs. per yard and in 1839 to 60 lbs. On almost all the lines laid between 1837 and 1839 stronger rails were used—rails of 52 lbs. per yard on the Newcastle and Carlisle, of $54\frac{1}{4}$ lbs. on the Newcastle and North Shields, of $56\frac{1}{2}$ lbs. on the York and North Midland, of 60 lbs. on the Great North of England and 55 and 63 lbs. on the Hull and Selby Railway. In 1841 rails of 73 lbs. per yard were being rolled for the Stockton and Darlington Railway in the newly-established Middlesbrough Ironworks. A greater lamination of the surface of the rails

* Report on Maintenance of Way, 20th July, 1849.

† *Ibid.*

appears to have taken place on this line than on any other in the kingdom, which the well-known engineer, Mr. John Dixon, attributed not so much to the amount of the traffic—about five times the gross weight of that upon the London and Birmingham Railway—as to the absence of springs in the coal-waggons.* A corresponding increase took place in the weight of the chairs. The rails of 40 lbs. per yard were seated in chairs of 14 and 15 lbs. and the heaviest of all in chairs of 26 and 32 lbs. Where a junction occurred between rails of different sections special chairs had to be cast for their accommodation. In less than twenty years the weight of metal per mile of single track on the Stockton and Darlington Railway had increased 300 per cent., viz., from $53\frac{1}{2}$ tons to 156 tons, and the cost of metal per mile 200 per cent., viz., from £611 to £1,250.

Stone blocks for sleepers continued to be used up to and even beyond 1841, the size being increased on locomotive lines from $18 \times 14 \times 8$ inches and $20 \times 16 \times 11$ inches to $24 \times 24 \times 12$ inches, and the weight from $1\frac{1}{2}$ and $2\frac{1}{2}$ cwt. to 3 and $3\frac{1}{2}$ cwt., and in some cases to $4\frac{1}{2}$ cwt. each.

Wooden cross sleepers were coming into fashion, but so late as 1843 John Dixon expressed the opinion that, all things considered (especially the durability of stone over wood), the cross sleepers were inferior to stone-blocks.† The objection to most of the lines laid on stone blocks was the perpetual jolting experienced. Passengers on the Newcastle and Carlisle line suffered greatly from it.‡ On the Stockton and Darlington Railway, however, there was not the same cause of complaint: “whether it was from the coal ballast or what I do not know,” wrote one railway traveller—Mr. Herapath—but the harshness I have invariably found upon stone blocks was not to be found here, the draft appeared to be as soft and silent as on wood.”§

Twenty-five of the 425 miles were laid on longitudinal sleepers which made travelling very comfortable on the Newcastle and North Shields and Hull and Selby Railways. The motion of the carriages on the former line, according to one writer, was “exceedingly smooth and equable.”|| “After trying all the principal railways in England as well as several in other countries,” declares another, “I have found none on which the motion is so

* Report on the State of the Line, 24th October, 1843. In reply to an inquiry from Mr. Dixon, the engineer of the Manchester and Leeds and North Midland Railways stated that they had little or no lamination of their rails except that which was caused by the contractors' waggons used only a few months in constructing and ballasting the line, which did more injury to the rails than all their subsequent traffic, “one waggon at high velocities without springs doing as much injury as four or five with springs.”

† Report on State of Line, 24th October, 1843.

‡ R. Lowry's Diary, 18th September, 1839.

§ *Railway Magazine*, 1841, p. 1075.

|| *Newcastle Journal*, 25th May, 1839.

easy and smooth as that between Newcastle and Shields, and I can ascribe this to no other circumstance than the mode of laying the rails on longitudinal bearers of timber.”* To the use of longitudinal timbers the directors attributed the comparatively small wear and tear of engine and carriage wheels during the first year and a half’s working of the line,† though it may be suggested that the absence of curves had also something to do with the favourable result.

There was another side to the medal. On the Hull and Selby Railway it was found difficult to keep the rail perfectly in contact with the timber. When it rained the water got in between the rail and the sleeper and the pressure of the wheels produced a sort of hydraulic action, forcing out the water and forming what Mr. John Gray, the engineer of the Company, called a complete slap-dashing machine. He had seen an engine go out as clean as a new pin and before half-an-hour had elapsed a clean spot could scarcely be seen on it. It was also found that in frosty weather there was more slipping on the longitudinal than on the cross sleepers. On one occasion, after losing time by slipping on the level, the engine approached the embankment between Hessle and Ferriby, and Mr. Gray began to fear that it would stick fast at this point as the gradient was 1 in 110, but, in describing the trip, he said, “As soon as we quitted the longitudinal road the engine ceased slipping; we put on full steam, and the engine went up like an arrow, and we made up for our lost time. We had then got to the top of the elevation at Ferriby station; we again came on the longitudinal sleepers and again commenced slipping in the same manner, and so continued for about seven miles; then we came on the cross sleepers again before ascending the bridge over the Market Weighton Canal; and as soon as we got upon the cross-sleepers the slipping again ceased.‡ One train on the Hull and Selby Railway is stated, owing to the frost, to have been two hours in running two miles.§

The first switches used on the earlier lines—the Stockton and Darlington, Clarence and Leeds and Selby Railways—consisted of pointed rails about a yard long, pivoted at the heel ends without rods or gear. They were movable directly by hand, the fireman acting usually as pointsman.|| The

* *Chambers’s Journal*, 1840, p. 191.

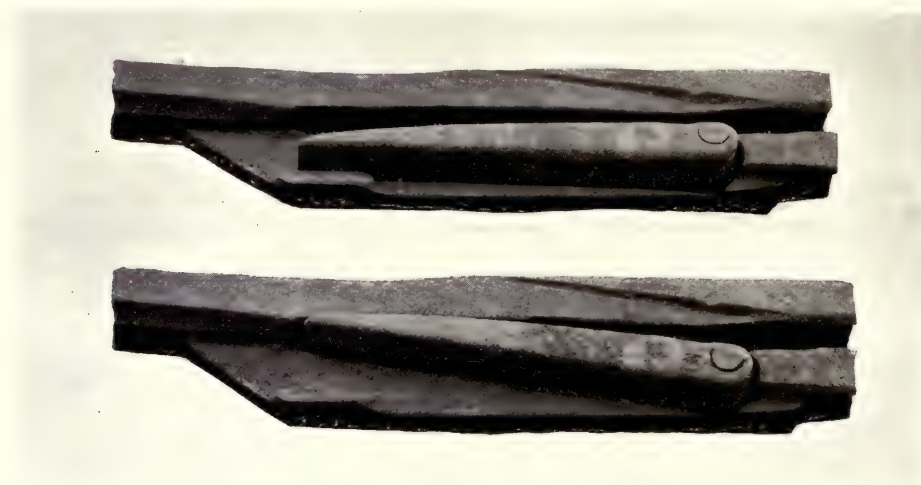
† *Railway Magazine*, 1841, p. 98.

‡ *Gauge Evidence: The Railway System illustrated*, by Samuel Sidney, 1846, p. 311.

§ *Yorkshireman*, quoted in *Railway Magazine*, 16th January, 1841.

|| It was in going before the engine to attend to the switches one midnight in June, 1838, that the fireman of the “Beehive” found a packman asleep on the line with his head across one of the rails (John Sidgwick’s *Minute Book*, 27th June, 1838).

facing-switches of this primitive type required to be carefully watched during the diversion of a train from one line to another. "As the waggons travelled slowly along, the fireman, from time to time, gave the tongue a hitch to close it, in the interval between the passing of one wheel and another, an operation requiring both a quick eye for wheels and a quick hand at the switch-tongue."* A "fatal facility" was displayed by the waggons in getting off the line at the switches. Twice in the course of one short journey was a passenger train stopped, on the 3rd September, 1839, between Darlington and Shildon by mishaps of this kind which had occurred within a few miles of each other.†



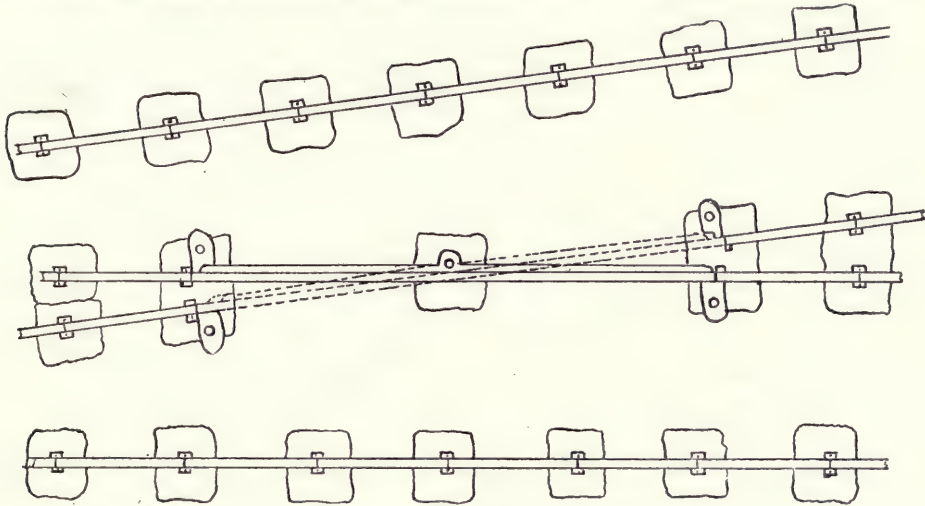
EARLY SWITCHES.

At junctions where the traffic required the attendance of a pointsman, the adjustment of the switches was effected by mechanical means consisting of handle, or lever-key, as it was called, vertical spindle in a cast-iron stand, eccentric sheave and horizontal connecting-rod. The safety-switches of the inclines (first adopted, it is believed, on the Stockton and Darlington Railway)‡ were early examples of points controlled from a distance—the lever by which they were moved being sometimes 30 yards lower down the bank. Self-acting switches of the type we are describing were used on parts of the

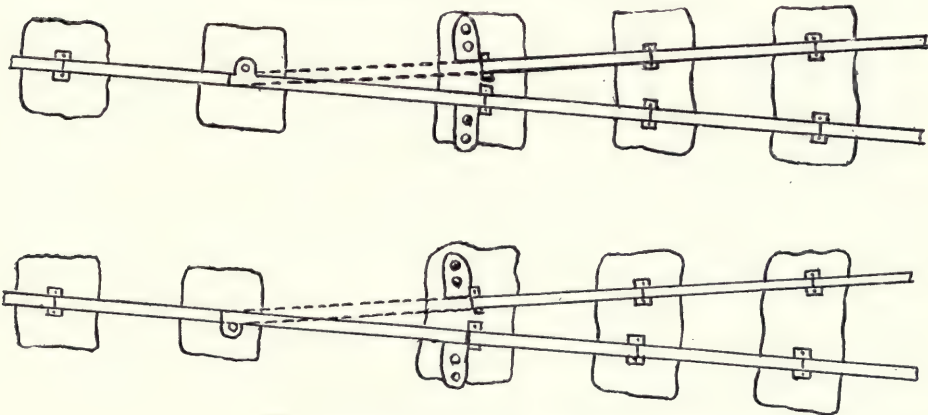
* *Fixed Signals of Railways*, by R. C. Rapier, 1874, p. 22. † John Sidgwick's Minute Book.

‡ O. D. Hedley's *Transit of Railway Carriages on Inclined Planes*, 1834, p. 26.

Newcastle and Carlisle and Stanhope and Tyne Railways, the automatic working of these switches being effected by means of counterweights or



SHIFT-RAIL PIVOTED IN THE MIDDLE.



SHIFT-RAILS PIVOTED AT THE END.

springs which kept the tongue-points in contact with the stock rails.* Trains approaching the point-end were diverted into another line, those approaching

* The idea of making switches self-acting by connecting them with a weight hanging over a pulley in a hole in the ground is said to have originated with the late Mr. George Brown of Gateshead, the plan being first tried on the Sheriff Hill waggonway in the year 1826 or 1828 (*Newcastle Daily Chronicle*, 12th April, 1907). If this be so, the idea must have been adopted soon afterwards on the Killingworth waggonway, for self-acting switches were there as early as 1830.

the heel end pushed the obstructing tongues sideways with the flanges of their wheels leaving the weights or springs to bring them back into their normal position.

Switches of another type, similar to those laid down by contractors on their temporary railways, were used on the Newcastle and Carlisle, Brandling Junction and other early lines. They were butt-ended, movable rails, 9 feet long, which worked in pairs from pivoted ends, sliding sideways within the limits of cast-iron frames of wedge-like shape, between the fixed rails of the main line and the fixed rails of the line diverging from it. They were moved by the mechanical means already described and kept in position by metal chocks. Some of the through-shunts of the Stockton and Darlington Railway were formed of "shift rails," which consisted of a long crossing rail and two short switch-rails, the former pivoted in the middle, the latter at one end. The shifting of these rails from one line to another was done by hand. Switches of a modern type began to come into use between 1839 and 1841, the first pair for the Stockton and Darlington Railway being made in 1839 from 60 lb. rails and laid down at Newport, near Middlesbrough, on the 6th April in that year.*

Signals had been used before 1825 to facilitate the working of inclined planes, and they were erected in similar situations on the Stockton and Darlington Railway, being called at first telegraphs. In working the extensive traffic on this line no protection whatever was afforded by signals. The enginemen were expected to take care of themselves and their trains, and, as a rule, they managed remarkably well. At night it was sometimes found necessary to signal to one another, and, on these occasions, they either waved a low-rope or took a shovelful of hot cinders from the fire and threw them up in the air. At an early period square boards with the word "signal" painted upon them were fixed to posts at short distances from the level crossings† to remind the enginemen to slacken speed and ring their bells. It was suggested in 1837 that some lamps which were required for lighting the stations of Fighting Cocks and Yarm might be placed upon the signal-boards having the dark side turned to the engine when no passengers were waiting to be taken up.‡ Either before or soon after this date a candle, placed in the window of the station-house, served as a signal, the absence of it implying that the enginemen might proceed without stopping.

* R. J. Semple's Notes. † Whishaw's *Railways of Great Britain*, 1842, p. 415.

‡ John Graham's Reports, 17th November, 1837.

On the earlier passenger lines of the North Eastern Railway red and white flags were used as signals by day and lamps with coloured reflectors by night. These were either held in the hand or hoisted on poles. A glance at the instructions to enginemmen approaching Brockley Whins will show how, in November, 1839, a busy crossing was worked under the old system of signalling. Near the crossing, on each line, stood three posts, a short distance apart, the first post on the Brandling Junction line having a white flag upon it and the first post on the Stanhope and Tyne line a red flag. When a train reached the first post the enginemman blew his whistle; at the second post he slackened speed; if there was a flag hoisted at the crossing—white for the Brandling Junction and red for the Stanhope and Tyne trains—he proceeded through the crossing at half speed, but if no flag was exhibited, or if both flags were hoisted and waved backwards and forwards he stopped at the third post. The same rules were observed at night time, when lamps were hoisted instead of flags. During fogs he blew his whistle at intervals all the way from the first to the third post, where he was obliged to stop and send his fireman to the signalman for orders.* At an important place like Milford South Junction there was no post, in 1840, on which to hoist lights, all signalling by night as well as by day being done by hand.† The advantages of fixed signals had been shown on the Grand Junction Railway since 1838, and it was not until 1840 that the early lines of the North Eastern Railway began to adopt them. In that year discs were connected with the switches at both ends of the Newcastle and North Shields Railway to show the enginemmen whether the switches were right or not.‡ Revolving poles with red discs, 4 feet in diameter, and handles to turn them, were put up in certain places on the Newcastle and Carlisle line, the exhibition of the signals being considered to block both lines so that a train arriving at a station where another one was standing on the opposite line of rails had to wait outside until the first had left.§ Another type of signal was erected by the Stockton and Darlington Railway at what was then known as Croft Branch End and later as York Junction. It was a pole fitted with a pulley from which, suspended by a chain, hung a lamp 4 feet high, 12 inches wide and 22 inches clear of the glasses, “caution” being enjoined when the slide

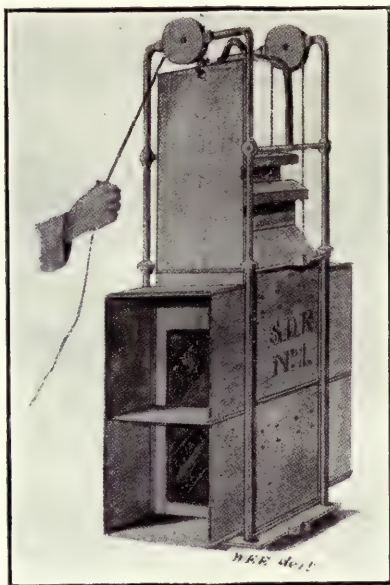
* Regulations for the enginemmen of the Brandling Junction and Stanhope and Tyne Railways, October 30th, 1839.

† *Railroad Quarterly Journal*, 1841, p. 72.

‡ Minutes of Newcastle and North Shields Railway Company.

§ *Fixed Signals on Railways*, by R. C. Rapier, 1874, p. 8.

was pulled half way up and a green light shown and "danger" indicated when the slide was pulled the whole way up and a red light shown.* The signal with triangular shaped board, which is considered to have been peculiar to the Stockton and Darlington Railway, was not introduced until a few years later.



(From Railway Magazine, by permission.)

EARLY SIGNAL LAMP.
STOCKTON AND DARLINGTON RAILWAY.

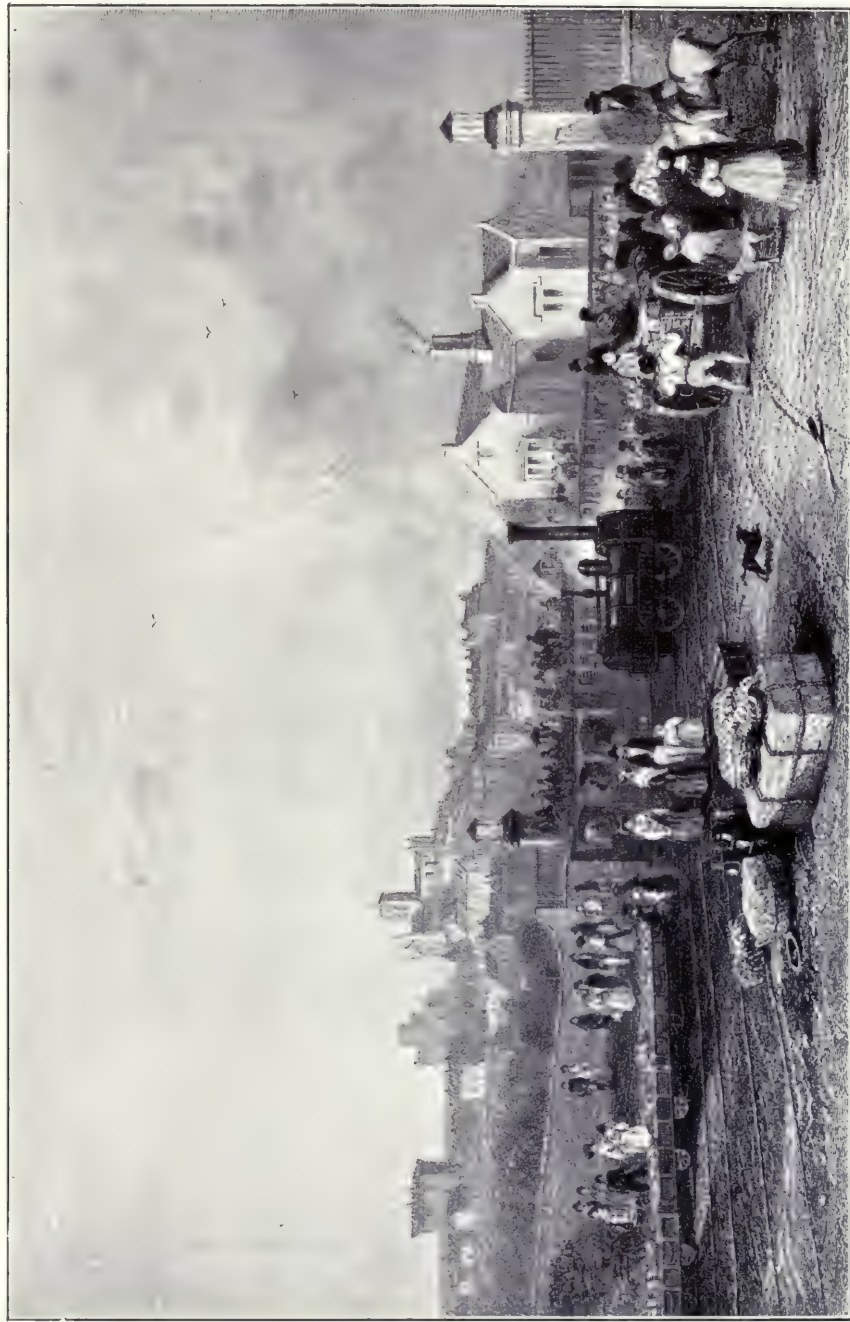


EARLY SIGNAL.
STOCKTON AND DARLINGTON
RAILWAY.

The stations on the early lines were generally built with a greater regard for economy than convenience. At some of the terminal, and at most of the intermediate, stations there were no platforms at all. A few stations (on the Newcastle and Carlisle Railway) had a platform on one side only. When a station was provided with platforms they were often inconveniently low, those at Milford (Leeds and Selby), for example, being only 6 inches in height.† The type of the Stockton and Darlington stations may be

* *Engineering*, 1st October, 1875, p. 228.

† Whishaw's *Railways of Great Britain*, 1842, p. 179.



J. W. Carnichael, del.

Hexham Station.

J. Archer, sc.

inferred from a remark of Whishaw's that they were "very properly of an inexpensive character throughout."* A small goods warehouse transformed into a booking office, waiting-room and cottage with a narrow wooden platform, approached by a flight of steps from the east side of the North Road, near the Skerne Bridge,† that was the station which sufficed for Darlington from 1833 to 1842.

At Stockton there was a wooden coach-shed near the depôts in Bridge Road, but no platforms until 1836, when a little stone station was built on the site of a timber-loading siding about 40 or 50 yards to the north-west of the low bay-windowed house which stands beside the railway with the mark of the station clock still visible on its quaint brick front. At the Clarence Station in North Road it was not until 1838 that a waiting-room was provided. At Middlesbrough the station, from 1834 to 1837, was merely a coach-shed standing on a siding near the river behind that part of the old shipping staiths which is now known as "Watson's Wharf" and not far from the old Packet Wharf.‡ The shed was removed in 1837 to a new site, on the north side of Commercial Street immediately facing the present Custom House buildings, and on this site, now occupied by Messrs. John Turner and Company's Engineering Works, was erected a larger passenger station which, after the opening of another passenger station at the foot of Sussex Street in 1847, was made into a goods station.

North of the Tees and Skerne there were a few pretty station-houses on the Newcastle and Carlisle Railway—to Dr. Granville they seemed "perfect specimens of taste and style in architecture,"§ but, with these exceptions, it would have been difficult to find any station buildings which were either commodious or attractive. Certainly not in Newcastle-upon-Tyne. The Close station of the Newcastle and Carlisle Railway, used for passengers and goods from 1st March, 1837, to 21st October, 1839, and for goods only from the 21st October, 1839, to 3rd January, 1842, was merely a part of an old riverside mansion with a quay attached to it communicating by steamboat and lighter with Redheugh. The Elswick station of the same Company was a temporary wooden shed in Railway Street between Plummer Street and Ord Street. The Manors Station of the Newcastle and North Shields Railway consisted of a temporary booking-office and waiting-room with plat-

* Whishaw's *Railways of Great Britain*, 1842, p. 416.

† *Newcastle Weekly Chronicle*, 2nd October, 1875; *The County Monthly*, May, 1902, p. 63.

‡ *Middlesbrough: Its History, Environs and Trade*, 1899, p. 26; *Newcastle Weekly Chronicle*, 2nd October, 1875.

§ *Spas of England*, 1841, p. 311.

forms which, for some months after the opening, had no roof over them and no seats for the convenience of waiting passengers. None of the stations between the Tyne and the Tees can have been of a much ruder type than that of Monkwearmouth. It was situated a mile from Sunderland Bridge in the angle formed by Broad Street and Portobello Lane. One passenger, who has left a record of his impressions, was inclined to think that it had been brought to this spot "for the purpose of escaping public observation."* The state of the roads in bad weather made it difficult of access. There was only one waiting-room, of modest dimensions, for all classes of passengers. The station shed—a wooden one—was so short that it did not cover more than two carriages. The usual accommodation provided for civilised people was entirely wanting at this, as, indeed, at nearly every other Brandling Junction station. At South Shields also there was only one waiting-room provided in the old station, kept clean by a man who sold oranges on the platform, the service being rendered in return for the permission to trade on the station premises. Any "better sort of people" were usually invited to sit in the stationmaster's office.† The "coach-office" of the Stanhope and Tyne Railway Company at South Shields was at 31, East King Street, and, to reach the train, the passengers had to pass through the premises of the Bridge Inn.‡ The booking-office at Shildon in 1837 was in the "Masons' Arms."§ At Sedgfield, on the Clarence Railway, the station was a public-house and the stationmaster mine host of the "Stag and Dragon."|| Some little interest attached, in 1840 at least, to the Gateshead station of the Brandling Junction Railway on account of the artificially raised site and the arrangement of the warehouses below,¶ also to the eastern terminus of the Newcastle and North Shields Railway on account of its triple-arched timber roof (140 feet in length by 50 feet 6 inches in width), which was formed like the great viaducts on the laminated principle.** With the exception of Carlisle, Hexham and North Shields, the only stations of any size having a permanent character were to be found south of the Tees—at Leeds, Selby, York, Hull, Northallerton and Thirsk. These were of simple and appropriate design, but in no way remarkable as specimens of the industrial architecture which railways had introduced.

* Rd. Lowry's Diary, 3rd November, 1839.

† *Report on the Affairs of the Brandling Junction Railway Company*, Qns. 505 and 578.

‡ Handbill, 1840.

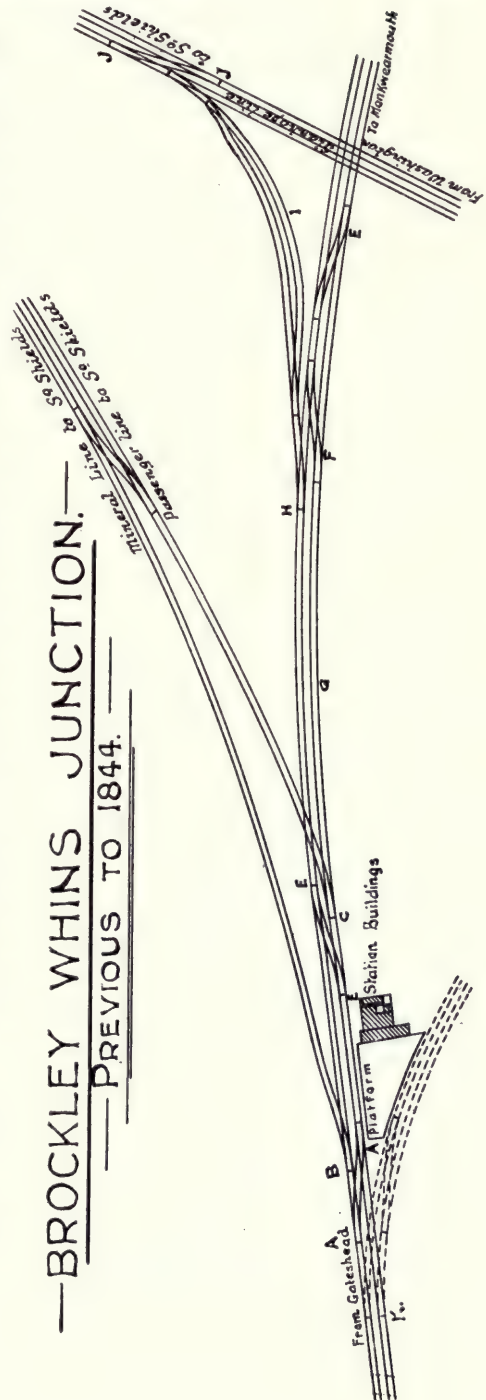
§ Minutes of Stockton and Darlington Railway, 3rd March, 1837.

|| *Railway Times*, 1844, p. 377.

¶ *Penny Cyclopædia*, 1841, vol. xix., p. 25.

** *Trans. Inst. Civ. Engineers*, vol. v., p. 230.

There was comparatively little shunting at the early stations, the reason being that the transference of rolling stock from one line to another was mostly effected by means of turntables. At Brockley Whins, however, an interesting series of shunting operations took place on the arrival of trains from three different points. Having closed the Biddick or Harton Branch soon after it had been opened, the Brandling Company brought their traffic between South Shields and Sunderland round by Brockley Whins, with the result that there was a somewhat complicated rearrangement of trains at the junction. First of all, a train arrived from South Shields at the one short platform, marked AC on the accompanying diagram. Some of the carriages were for Sunderland, and these the engine backed into the space, G, the others for Gateshead, it took to a point beyond and just clear of the switches, A. Next, a train arrived from Sunderland, and as the line was blocked by the carriages standing at G, it had to go round the obstruction by way of the cross-over roads, E and EE (then called through-shoots or through-shunts) to get to the platform. The engine being then detached, it worked its way round to the other end of the train, *via* the cross-over roads, AA and EE, for the purpose of taking the carriages for South Shields through the points, C, to the South Shields line, clear of the



points, D. The carriages left behind were then attached to those standing beyond the points, A, and the completed train went forward to Gateshead. Then a train from Gateshead arrived at the platform, *viâ* the cross-over road, AA. Taking the carriages for Sunderland from the "up" to the "down" line, by way of the cross-over road, EE, the engine backed them through the points of the cross-over road, F, to the carriages standing at G, to which they were attached. The engine with its full load of carriages now returned to the "down" line, by way of F, and proceeded to Sunderland. Finally, the engine standing on the South Shields line backed the carriages from Sunderland through the points, C, to the platform, where they were coupled to the carriages from Gateshead and the train, thus completed, passed through the points, C, and proceeded to South Shields.*

Between 1840 and 1844, in which year the curve connecting the Brandling Junction with the Stanhope and Tyne line near Boldon Colliery was opened, another skilful manœuvre, not unattended with danger,† was performed at Brockley Whins when the train from Rainton Meadows happened to arrive too late to catch the Brandling Junction train, and had to proceed to Gateshead with the passengers. It was necessary for the engine to be changed from one end of the train to the other. Detached from the moving train about half-a-mile from Brockley Whins, when it steamed ahead past the junction, then ran back to the junction and entered the loop line, the carriages following at a slower rate of speed had also passed the junction, the engine slipped out through the points and regained possession of its train which it then took, tender first, through the loop line to Brockley Whins and thence to Gateshead.‡

At Hull a manœuvre of a somewhat similar kind was executed. When a train arrived at the gate opposite to the end of Manor House Street, the engine, uncoupled from the carriages while they were still in motion, ran ahead and was switched on to the northernmost line. The carriages following by the impetus acquired ran into the station. On one occasion, 7th September, 1840, the impetus given was too great and the carriages, not being braked, ran against the partition-wall with such force that they broke it down and the first carriage passed completely through as far as the passage leading to the waiting-rooms.§ After this accident in which the

* *Ex inf.* Joseph Stephenson.

† As shown by a slight accident which occurred here on the 28th February, 1844. *Report on Atmospheric Railways*, 1845, appendix 189.

‡ T. E. Harrison to Richard Till, 28th February, 1844.

§ *Quarterly Railroad Journal*, 1841, p. 31.

guard, fireman and a passenger were injured, the manner of getting the train into the station was changed. A strong cable was attached to the train and made fast to a post, and with this it was afterwards pulled into the station like a ship to a quay.*

) <div>Yarm Branch to <i>Darlington</i></div> <div><i>July 20</i> _____</div> <div>_____ of _____ 183(5)</div> <div><i>Wm Johnson</i> Passenger.</div> <div>Paid, <i>paid 2 1 0</i></div> <div><i>T Sample</i> Agent.</div> <div>[Turn over.</div>
--

This Ticket to be delivered to the
Engine-Man, expires with the date, and
is not transferable.

PAPER TICKET USED ON THE STOCKTON AND DARLINGTON RAILWAY IN 1835.

The methods of doing business at the stations were those of the old coaching days. On the Stockton and Darlington Railway tickets were used as early as 1835. One of these—a yellow paper coupon from Yarm Branch to Darlington—is here reproduced. According to the directions on the back

* MacTurk's *A History of the Hull Railways*, 1879, p. 78.

the passenger was instructed to deliver the ticket to the engine driver at the end of his journey. A number of "free coach tickets" were presented, by his fellow directors, to Mr. Joseph Pease, one of the Parliamentary candidates for South Durham "for the purpose of bringing his friends from Shildon and Stockton on the day of nomination" (January 13th, 1835), and on "the day of chairing."* Most of the passengers travelled at this time without tickets, the fares being usually collected by the guard and, occasionally in his absence, by the engine driver.† "The subject of giving tickets to coach passengers with the view of keeping a check on the number travelling" came up before the Board in July, 1835,‡ but no better system was introduced until 1836. When the western portion of the Newcastle and Carlisle Railway was opened, the agents at the intermediate stations "received the money from the passengers without giving them any tickets." This road-money, as it was called, they handed over at once to the guard of the train by which the passengers were going and, consequently, they had no books to keep.§ Tickets were issued in September, 1834, by the Leeds and Selby Railway Company and, after 1836, they were in general use on all the passenger lines in the North of England.

These early tickets were paper coupons, printed, usually with counter-foils, on plain and coloured sheets and supplied to the stations in books. The stationmaster at South Shields (Brandling Junction Railway), for instance, received 31 books of tickets for Gateshead, being one for each day in the month. These were supposed to contain 1,000 tickets, but they sometimes contained more and sometimes less. Then, as there was the possibility of a book being used up by the middle of a day, the stationmaster had a reserve stock of 31 other books containing each 1,000 tickets or more. He also had ticket-books for the intermediate stations. Altogether he had, sometimes, as many as 100,000 tickets on hand, of which no particular account was kept at the head office. He could, if so minded, tear out a leaf from one of these books, and issue the tickets without making a return of them, and it was even possible to take away an entire book without being detected.|| On the Stockton and Darlington Railway the passengers were counted from time to time as a means of checking the delivery of tickets. Another method for effecting the same purpose which had been adopted on

* Minutes of Stockton and Darlington Railway Company, 9th January, 1835.

† *Newcastle Weekly Chronicle*, 2nd October, 1875.

‡ Minutes of Stockton and Darlington Railway Company, July 10th and 24th, 1835.

§ *Fourth Report on Railways*, 1841, Qn. 4491: Lowry's Diary, 18th August, 1836.

|| *Report on the Affairs of the Brandling Junction Railway Company*, 1843, Qns. 616-619.

NEWCASTLE AND CARLISLE RAILWAY.
 No. _____ o'Clock, _____ 1836.
 From Carlisle to Warden.
 1st Class—Paid 6s. 3d
 This Ticket will be required on your Arrival at your Destination.
 NOTICE.—No Fees allowed to be taken by any Guard, Porter,
 or other Servant of the Company.

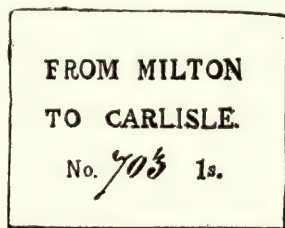
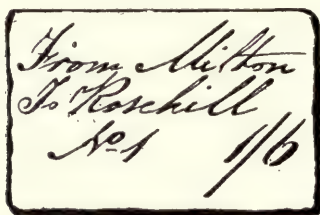
NEWCASTLE AND CARLISLE RAILWAY.
 No. _____ o'Clock, _____ 1836.
 From Greenhead to Hexham.
 2nd Class—Paid 3s. 0d.
 This Ticket will be required on your Arrival at your Destination.
 NOTICE.—No Fees allowed to be taken by any Guard, Porter,
 or other Servant of the Company.

 * **NEWCASTLE AND CARLISLE RAILWAY.** *
 * No. _____ o'Clock, _____ 1837. *
 * From Wetheral; to and from Carlisle on the *
 * same Day. *
 * 2nd Class—Paid 1s. 0d. *
 * This Ticket must be shown to the Station Keeper at Carlisle. *
 * previous to taking your Seat on your return. *
 * NOTICE.—No Gratuity allowed to be taken by any Guard, *
 * Porter, or other Servant of the Company *

EARLY PAPER TICKETS.

NEWCASTLE AND CARLISLE RAILWAY.

the London and Greenwich Railway, that of making the ticket-holders pass through a turnstile, was apparently tried on the Newcastle and North Shields Railway in 1841.* A few specimens of the tickets in use on the Newcastle and Carlisle Railway have fortunately been preserved. The first-class tickets from Carlisle to Warden (an old station east of Fourstones at a place called "Quality Corner") were printed on buff paper, the second-class tickets from Greenhead to Hexham on green paper. In the one case the ticket was a receipt for 6s. 3d. paid and in the other for 3s. There was an intimation, immediately below the amount paid, that the ticket would be required from the passenger on his arrival at his destination and a notice that no gratuity was allowed to be taken by any guard, porter or other servant of the Company. Tickets to Carlisle and back on the same day,



(From Railway Magazine, by permission.)

EARLY CARDBOARD TICKETS.†
NEWCASTLE AND CARLISLE RAILWAY.

printed on white paper, were issued at Wetheral on the 22nd May, 1837,‡ being among the earliest, if not the first, return tickets used in England. Up to this time the fare from Wetheral to Carlisle and back had been 1s. 6d. It was now reduced to 1s. The ticket, according to instructions printed upon it, had to be shown to the station-keeper at Carlisle before the passenger took his seat in the train to return to Wetheral. Double tickets, as they were called, or "tickets to clear the trip both ways," were issued from the intermediate stations of the Newcastle and North Shields Railway on 18th October, 1841, but no reduction was made on the two single fares and the passenger, by taking a return ticket, merely saved himself the trouble of booking again.§

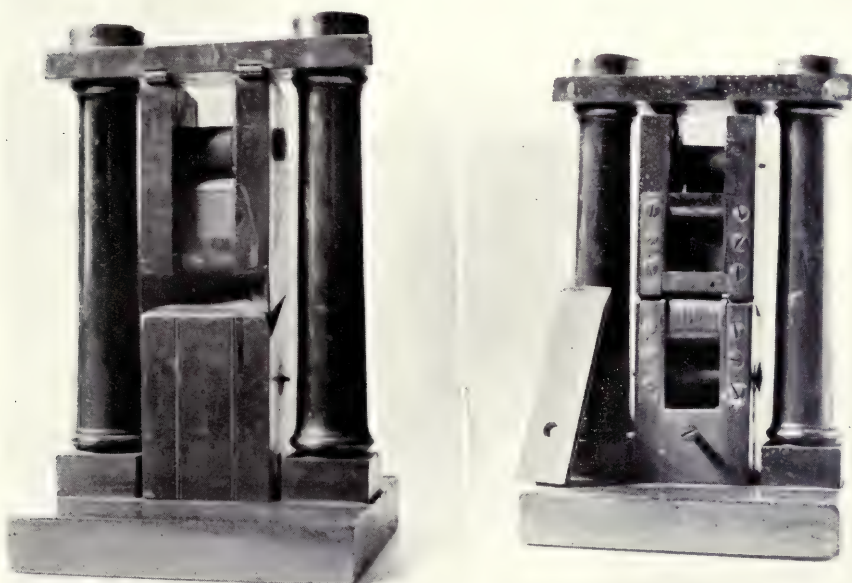
* Minutes of Newcastle and North Shields Railway Company, 19th June, 1841.

† One of the tickets was written and the other printed by Thomas Edmondson, when agent at Milton.

‡ Rd. Lowry's Diary, 22nd May, 1837.

§ Gateshead Observer, 16th October, 1841.

The process of booking a passenger in those days of paper tickets was a slow and tedious one, the clerk having usually to number the ticket and fill in with his pen, on both ticket and counterfoil, the date of issue, the time of departure of the train and, in some cases, the name of the station for which it was available. On account of the labour involved in booking, it was found necessary on some lines—the Brandling Junction, for example—to close the station doors five minutes before the trains started. To one of the inter-



TICKET-DATING PRESS.

mediate stations on the Newcastle and Carlisle Railway, Milton, now Brompton Junction, the directors had appointed a singularly able and ingenious man, by training a cabinet-maker, Thomas Edmondson, brother of George Edmondson, the well-known educationalist. Dissatisfied with a system which did not allow him to keep correct accounts, he conceived the idea of printing and issuing cardboard tickets numbered consecutively. These tickets, printed by himself from ordinary type,* and afterwards numbered

* Rd. Lowry's Diary, 18th April, 1837.

by hand, were placed in tubes arranged in cases. When required, they were taken from the top instead of the bottom of the tubes, being pressed upwards by spiral wire springs. At first they were issued without being dated, but objections having been raised to this mode of delivery, Edmondson invented and brought into use in August, 1837,* the dating-press—an ingenious and useful apparatus which, attached by hinges to a little mahogany porch-shaped frame about a foot high, acted like a knee-joint when the clerk pushed the ticket between the impressers. Machinery for printing tickets was invented in the spring of 1838† and, in the autumn of that year, this new railway ticket system, which facilitated so greatly the booking of passengers and simplified the subsequent form of station accounts, was adopted generally on the Newcastle and Carlisle line. The tickets were printed at first in strips, a “ticket-cutter” being employed at the Close Station, Newcastle, at the rate of 3d. an hour to separate them with scissors. Edmondson’s ticket system attracted the attention of Captain Lawes when on a tour in the North of England, and, in April, 1839, he secured the services of the inventor for the Manchester and Leeds Railway.‡

The Great North of England Company began issuing cardboard tickets in 1841, and their example was followed soon afterwards by the Hull and Selby and York and North Midland Companies. Metal tickets appear to have been used on the Middlesbrough Branch of the Stockton and Darlington Railway in 1839.§ An extremely beautiful medal, intended to be used as a railway pass by the directors and officers, was designed in 1840 by W. Wyon, R.A., for the Newcastle and Carlisle Railway Company. It was cast in gold, silver and bronze, and displayed on the obverse a figure of Mercury with a view of Newcastle and Carlisle beneath and the legend “Planum per ardua duco,” and, on the reverse, shields containing the arms of Newcastle and Carlisle divided by a caduceus and supported by cornucopias (see p. 375).

The accommodation for goods at the early stations was very inadequate. At Leeds and Selby, while passengers were coming and going in one part of the shed, goods were being handled in another. It is surprising how few weighing machines there were. Even at a place like Carlisle the Railway Company did not begin weighing goods until the 22nd May, 1837, nearly

* Rd. Lowry’s Diary, 1st September, 1837.

† *Ibid.*, 4th March and 26th April, 1838.

‡ *Fourth Report on Railways*, Qn. 4341.

§ Minutes of Stockton and Darlington Railway Company, 18th October, 1839. It was some years after this, in 1843, that the well-known metal tickets of the Newcastle and North Shields Railway began to be used.

a year after the opening of the London Road Station.* North Shields, which had a warehouse, was without a weighing machine for many years. Castleford and Sherburn-in-Elmet, to name but a few of the other stations, were similarly unprovided. The weight of goods was guessed or taken from the consignment-note. "How do you make your calculation"? a witness was asked during the Brandling Junction inquiry in 1842. "From my experience and by comparing them with other things" was the reply.† The goods agent knew, it was stated, that a tobacco cask weighed from 50 to 60 lbs., "and so of other things."‡ The guessing of weights might not always be satisfactory to the sender, but, certainly, the taking of weights from the consignment note implied a faith in human nature which was not justified by experience. Of the methods of dealing with parcels it is perhaps unnecessary to say more than that the pioneer railway seems to have anticipated the idea of parcel stamps in granting to coal-owners and fitters the privilege of purchasing "franks" for the purpose of freeing parcels to and from the collieries with orders, etc., connected with the coal trade, these franks being sold at the rate of 1s. per dozen.§ It seems to have been a pretty general practice at this time for the stationmaster or booking clerk to take home with him at nights any cash in hand and keep it in his bedroom for safety.||

The trains arriving at, and departing from, these old stations presented a striking contrast with those of the present day. Apart from the difference in the size, design and number of the carriages, there was a marked difference in the make-up of the trains. It was not unusual to see passenger carriages attached to mineral and goods trains and goods waggons and sheep trucks to passenger trains. Iron bars might occasionally be seen tied to the footboards of carriages and passengers riding in trucks.¶ The luggage strapped on the top of the carriages; the guard perched aloft on his outside seat, resplendent in red coat with silver buttons, fawn waistcoat and trousers, and black or white beaver hat; the driver and fireman in moleskin suits unprotected by weather-board or cab—these were details which height-

* Rd. Lowry's Diary, 22nd May, 1837.

† *Report on Affairs of Brandling Junction Railway Company*, Qn. 338. ‡ *Ibid.*, Qn. 437.

§ *Minutes of Stockton and Darlington Railway Company*, 12th June, 1835.

|| *Report on Affairs of Brandling Junction Railway Company*, Qns. 637 and 902. A circular was actually sent to the station masters of the Newcastle and Carlisle Railway Company so late as 1850 instructing them to remove the office cash to their bedrooms at night (*Minutes*, 11th December, 1850).

¶ Jos. Stephenson's Notes.



Drawn by T. H. Hair.

Etched by T. A. Prior.

PASSENGER TRAIN NEAR PITTINGTON STATION, DURHAM AND SUNDERLAND RAILWAY.

ened the contrast. Certain peculiarities might be noticed in the working of the trains previous to 1841. Contrary to established custom, the trains of the Clarence and Newcastle and Carlisle Railway Companies ran on the right instead of the left hand side of the road. On some of the lines the trains did not stop at the intermediate stations unless the stationmaster "put the flag out," or gave some other signal to show that there were passengers waiting to be taken up.

Railway travelling was attended with considerable discomfort in these early times. Allusion has already been made to the amenities of open carriages. To these must be added the pitching motion of some of the carriages which was probably due to their short wheel-base. On the Brandling Junction Railway this motion was "precisely similar to that of a boat in a somewhat troubled sea,"* on the York and North Midland Railway it was "almost like the rolling of a ship at sea and went far to produce a similar unpleasant climax."† On the Durham and Sunderland Railway passengers were shaken while taken. Owing to the tightening and slackening of the rope as the engines passed over the crank centres the carriages, on arriving at the "bank-head" or making a false start were jerked, rather than drawn forward, the passengers being jolted unceremoniously to and fro.‡ The deprivation of pipe or cigar, to some passengers, would be among the inconveniences of railway travelling. In none of the carriages were they allowed to smoke. All the Companies had bye-laws prohibiting the practice. The directors of the Newcastle and North Shields Railway considered it "an evil that had caused injury to the best carriages, the parties getting lights after entering the carriages *from phosphorus boxes* for the purpose of smoking," and they announced that their servants had been instructed in all cases to proceed against the parties under the bye-laws and to expel them from the carriages at any station where they might be found smoking.§

The trains were worked under conditions which threw an undue amount of responsibility on the shoulders of the enginemen. Working time-tables were unknown and the enginemen, unprotected by signals, had to make their way cautiously from point to point by the aid of a few general directions and of such information as they could pick up *en route* with regard to the other trains on the line. As there were no guards with the mineral trains,

* Whishaw's *Railways of Great Britain*, 1842, p. 74. † *Youth's Instructor*, vol. vi., p. 306.

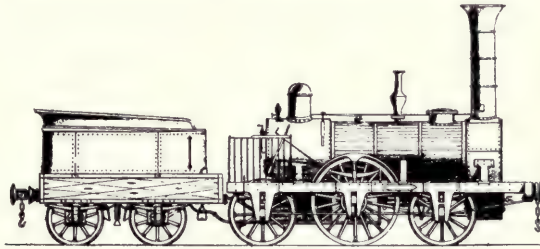
‡ Whishaw's *Railways of Great Britain*, 1842, p. 74; *Northern Tribune*, 1854, p. 138.

§ Minutes of Newcastle and North Shields Railway Company, 27th September and 1st October, 1839.

it was usual, on the Stockton and Darlington Railway, to set up a conspicuous object on the last waggon—a board by day and a fire-lamp at night by means of which an engineman could satisfy himself that his train was intact. An incident which occurred on the Newcastle and Carlisle Railway will show how difficult it was to work a railway without the electric telegraph. The “Hercules” had fractured an axle on the 23rd August, 1836, at Milton and blocked the “down” line. The next morning it was arranged that a train drawn by the “Samson” should travel on the “up” line, and a man was sent galloping along the railway with a message to the driver of the “Goliath,” bringing a train from Carlisle, to cross over to the “down” line and wait until the “Samson” had passed. The engineman obeyed instructions and waited an hour-and-a-half at Wetheral until the “Samson” came up. Through some confusion the driver of the “Samson” had not been told to proceed and he had waited at Milton for the arrival of the “Goliath.”* Here, then, were two trains within 10 miles of each other, waiting for the other to pass, neither of the drivers knowing the reason of the delay. Considering the dangerous conditions under which the traffic was worked, accidents involving loss of life were of comparatively rare occurrence. One of these accidents was caused by switches left in a wrong position at Great Corby on the 3rd December, 1836; another by the breaking of a rail on a curve of the Clarence Railway near Ferryhill on the 19th March, 1839; a third by the placing of loaded waggons behind a light horse box near Low Row on the 6th March, 1840; a fourth by the defective packing of a heavy iron casting near Howden, on the 7th August, 1840; and a fifth by the absence of proper signalling arrangements at Milford Junction on the 11th November, 1840. As the early railways were much troubled by mischievous people who tampered with the switches, placed wood and stone blocks on the line, cut incline ropes and threw down the parapets of bridges, it is surprising that the list of accidents is so small. Until the passing of Lord Campbell’s Act in 1846 the Railway Companies were not liable to pay compensation to the families of persons killed by accident, but they were frequently required to pay a pecuniary penalty to the crown as a deodand in lieu of forfeiture under an old law which Parliament afterwards described as “unreasonable and inconvenient.” Three cases of deodands stand out in the history of the early lines of the North Eastern Railway as illustrations of the “unreasonable” character of this law. The first was a deodand of £1,400 levied on the “Raby Castle” engine, the cause of the death of Thomas Gray, a waggoner

* Rd. Lowry’s Diary, 24th August, 1836.

who, when crossing Guisbrough Lane near the present Thornaby station with his team on the 19th October, 1839, was, according to the verdict of the coroner's jury, "feloniously cast to the ground."* The second was a double deodand consisting of £500 levied by one jury and 50 guineas by another on the engine (the "Collingwood") tender and carriages concerned in the accident near Howden,† the third was a deodand of £500 levied on the "Zetland" engine which ran into a standing train at Milford Junction.|| As a curious survival, the old law respecting deodands is not more interesting than the mental outlook of the jury who added the following pendant to their verdict: "They think it consistent in connection with this awful event to state their deep regret that the directors of the Leeds and Selby Railway and the Hull and Selby Railway should, by their conduct, sanction the violation of



THE "RABY CASTLE" ENGINE.

the Sabbath."§ As the Court of Queen's Bench afterwards quashed the inquisitions on an appeal being made against them by the Railway Companies, these deodands were never paid.||

In the working of the railways only a comparative degree of efficiency had been attained by 1841. The only really trained men were the engine-men, many of whom had gained their experience at Killingworth or acted as firemen under Killingworth men, a few of the guards who had served under the stage-coach companies, and the platelayers who had previously been employed on the old waggonways. As to the station clerks, they were often appointed, as we have seen in the case of Edmondson, without definite instructions and left to discover for themselves the best way of doing their work. Many of the services required on a railway—the working and repairing of the engines, the upholding of the road, as it was called, the pumping of water and the weighing of waggons were performed by contract. When the Railway Companies kept the work in their own hands the

* *Tyne Mercury*, 29th October, 1839. † *Railroad Quarterly Journal*, 1841, pp. 17 and 18.

‡ *Ibid.*, p. 78. § *Ibid.*, p. 18. || *Railway Magazine*, 1840, p. 77, and 1841, p. 688.

wages paid during this period were generally the following: enginemen, 24s. to 30s. a week; firemen, 15s. to 18s.; guards, 24s. and 26s., occasionally as much as 32s. 6d.; porters, 17s. to 22s.; policemen or switchmen, 17s. to 20s.; platelayers, 18s.; carriage cleaners, 15s. or 16s.; coke-fillers (men who filled the tenders), 15s. to 18s. Fines and deductions in respect of damage caused by negligence made frequent inroads upon the wages of the enginemen, who were constantly being reported for loitering on the road, running at too high a speed, refusing to start at any hour, and even, in two cases, for being asleep upon their engines when proceeding along the line. It was the fine-box which supplied funds for many of the charitable donations of the Stockton and Darlington Railway Company, and the engineman with docked wages could console himself with the reflection that his half-crown or half-sovereign, as the case might be, had gone to relieve a poor widow, mitigate the sufferings of a fellow workman, assist some unfortunate person to replace a horse killed on the railway or provide life-saving apparatus on the coast between Tees Mouth and Hartlepool.

The station masters of the terminal stations received about £100 a year, and those of the smaller stations between £60 and £80 a year, but houses were not at first provided. Inspectors or superintendents of police received £78 a year with uniform and sometimes an allowance for lodgings. Duties were not rigidly defined. A railwayman in those days played many parts. The station-keeper at Monkwearmouth had frequently to assist in loading the trucks in the goods sheds.* The goods agent at Darlington used to go with a truck load of goods to Shildon and deliver them.† The booking clerk at Carlisle had frequently to accompany the trains in the capacity of guard.‡ The enginemen and firemen of the Stockton and Darlington Railway filled their own tenders, shovelling the coals from the ground, and also oiled the axles of the waggons on the way.§ The guards collected the tickets, passing along the footboards from carriage to carriage, and on most of the lines started the trains. Hours were long for railway servants of every class. The stationmasters at Felling, Cleadon Lane and Brockley Whins, in receipt of 22s. a week, without a house, were on duty about 14 and 15 hours a day, attending on Sundays as well. The goods agent at Gateshead came at 6.30 a.m. and left at 8 p.m.|| Enginemen on the Newcastle and Carlisle Railway worked 12 hours a day, and their week consisted of 7 days.

* *Report on Affairs of Brandling Junction Railway Company*, Qn. 711.

† W. Hobson's Notes. ‡ Lowry's Diary, 1836. § *Proc. Inst. Mech. Engineers*, 1890, p. 188.

|| *Report on Affairs of Brandling Junction Railway Company*, Qns. 809-810, 775, 966-967, 328.

The percentage of working expenditure on the main lines of the North Eastern Railway at the close of this period was comparatively low. While the average ratio of expenditure to receipts on the principal lines in the United Kingdom in 1842 was 43·36 per cent. on the York and North Midland Railway it was only 36, on the Great North of England Railway 37, and on the Newcastle and Carlisle Railway 40. The Hull and Selby Railway was not worked more expensively than these other lines, but it was not utilised at this time to anything like its full capacity owing to the traffic which legitimately belonged to it still going by water, and a ratio of 52 per cent. was the result.

The management of the early lines was largely kept in the hands of the directors, and a considerable amount of work devolved upon members of the sub-committees. Men like William Kitching, Henry Stobart and Joseph Pease could not have given more assiduous attention to their own business concerns than they did to the affairs of the Stockton and Darlington Railway. The zeal and energy which George Hudson displayed in the promotion of the York and North Midland Railway he threw into the management of that railway, and his supervision extended to the minutest details of railway work. The authority he wielded was that of a dictator, and the railway flourished under his rule. No less untiring in his devotion to the interests of the railway which he controlled was Matthew Plummer, the chairman of the Newcastle and Carlisle Railway Company, whose great commercial knowledge was as invaluable to that concern as the engineering experience of Nicholas Wood, Benjamin Thompson and George Johnson. In striking contrast with these vigorously worked lines stand the Clarence and Stanhope and Tyne Railways—melancholy examples of unsuccessful management directed from Board-rooms in London.



METAL TICKET USED IN 1843. [Actual Size, $1\frac{3}{8}$ in. by 1 in.]

CHAPTER XII.

THE PROGRESS OF THE EAST COAST ROUTE.

[1841-1844.]

Immediately after the opening of the Great North of England Railway, a regular service of trains was established between Darlington and Newcastle by means of the coast lines. The distance by railway was 56 miles, and the trains ran in competition with the stage coaches, which had only 34 miles to travel. They performed the journey in about the same time as the coaches, but the passenger was carried more cheaply and in comparatively greater comfort. Twice in the course of his journey he had to take an omnibus—between the Stockton and Darlington and Stockton and Hartlepool stations at Stockton and between the Durham and Sunderland station at Sunderland and the Brandling Junction station at Monkwearmouth. At Haswell he had to change carriages, though his luggage went forward without transhipment. There were three trains a day from Gateshead, South Shields and Sunderland in direct communication with the Great North of England trains from Darlington to York. By means of a fourth, which left Gateshead and South Shields at 3 p.m. and Sunderland at 4, a passenger could proceed to Darlington, sleep there and catch the first train from that place to York the following morning at 5.45.* In the opposite direction there were also three trains a day, running in connection with which were two trains from Redheugh to Carlisle and one train from Redheugh to Haydon Bridge. Leaving York at 6 a.m., Darlington at 8.45, Stockton at 9.30, Hartlepool at 10.30, Sunderland at 1 and Redheugh at 2.30, a passenger arrived in Carlisle at 5.30 p.m. But the public convenience, no less than the interests of the Companies between Darlington and Rugby, required that there should be a continuous, if not a direct, line of railway between Darlington and Newcastle. The Great North of England Railway Company had exhausted their funds in making the southern and more easily constructed portion of their line, and for two years the scheme for linking up the existing railways between Darlington and

* *Gateshead Observer*, 17th April, 1841.

Gateshead had been steadily gaining ground. The promoters of the Northern Union Railway, as it was called, had already given notice in March, 1839, and again in February, 1840, of their intention to apply to Parliament for an

GREAT NORTH OF ENGLAND RAILWAY.

Time Bill—May 15th, 1841.

<i>From DARLINGTON to YORK.</i>					
	1st Train	2nd Train	3rd Train	4th Train LONDON MAIL	5th Train
	A.M. h. m.	A.M. h. m.	P.M. h. m.	P.M. h. m.	P.M. h. m.
Leaves Darlington ..	5.45	8.0	12.30	3.30	6.0
Croft	5.53	8.8	12.38	—	6.8
Cowton	6.10	8.25	12.55	3.50	6.25
Northallerton	6.32	8.47	1.17	4.12	6.47
Thirsk	6.55	9.10	1.40	4.35	7.10
Alne	7.26	9.41	2.11	5.4	7.41
Shipton	7.48	10.3	2.33	—	8.3
Arrives at York	8.15	10.30	3.0	5.37	8.30

<i>From YORK to DARLINGTON.</i>					
	1st Train.	2nd Train LONDON MAIL.	3rd Train	4th Train	5th Train
	A.M. h. m.	A.M. h. m.	A.M. h. m.	P.M. h. m.	P.M. h. m.
Leaves York	*6.0	7.20	9.35	2.30	6.0
Shipton	6.17	—	9.52	2.47	6.17
Alne	6.34	7.46	10.9	3.4	6.34
Thirsk	7.8	8.14	10.43	3.38	7.8
Northallerton	7.32	8.39	11.7	4.2	7.32
Cowton	7.54	9.0	11.29	4.24	7.54
Croft	8.12	—	11.47	4.42	8.12
Arrives at Darlington	8.30	9.25	12.5	5.0	8.30

* Every Monday the Morning Train from York will depart at 5 a.m., instead of 6 a.m., and arrive according to the following Time Table:—

LEAVES							ARRIVES AT
York, 5 a.m.	Shipton, 5.17	Alne, 6.34	Thirsk, 6.8	N. Allerton, 6.32	Cowton, 6.54	Croft, 7.12	Darlington 7.30

Coaches between Darlington and Newcastle meet the arrival and departure of every Train.

(3)

D. O'BRIEN, Secretary

J. & J. Readman, Printers, Darlington.

Act, and were only waiting for the necessary capital to proceed with the measure. A modification of the scheme, under the title of the North Junction Railway, had also been proposed by Mr. Ralph Ward Jackson with

the object of getting a portion of the Clarence Railway adopted as a link in the great chain of communication between the two capitals.

In the Parliamentary notice which appeared in February, 1840, the North Junction Railway was described as consisting of two separate connecting-lines, one from Darlington to Mordon Bridge and the other from Coxhoe to a point on the intended Northern Union Railway between Sherburn House and Sherburn Town. It subsequently occurred to Mr. Jackson that the traffic might be taken from the terminus of the Great North of England Railway along the Stockton and Darlington line for a distance of 5 or $5\frac{1}{2}$ miles and, by means of a short curve which would have to be made, along the Clarence Railway to Stillington and Coxhoe, thence by omnibus to the Durham Junction Railway at Rainton.* The promoters of the Northern Union Railway were disposed to join hands with him in furthering this plan,† but the Stockton and Darlington Board declined to have any dealings with the Clarence Company until a vexatious matter in dispute between them had been settled.‡ Besides, the Great North of England Company while prepared, at the suggestion of Robert Stephenson, to acquiesce in a diversion of their line at Thrislington on account of the heavy character of the works near Croxdale and Shincliffe and in the valley of the Wear, had no intention of abandoning any portion of their line south of Thrislington.

In March, 1841, the Commissioners, to whom Parliament had referred the question of railway communication between England and Scotland, reported in favour of the western route, this preference being given on the supposition that the line between Lancaster and Carlisle would be formed either before or at the same time as the line between Carlisle and Glasgow. In the event of the West Coast party being unable to comply with this condition, it was the opinion of the Commissioners that they ought to give way to the East Coast party and abandon their own project.§ This opinion was based on the assumption that there was not enough traffic between the two countries for both lines.

The continuation of the railway to the Tyne was now a question of strategical importance. According to Robert Stephenson, "it was the last step remaining to establish the East Coast route to Scotland,"|| which would

* R. W. Jackson's Bill of Costs, 6th March and 18th July, 1840.

† Minutes of Great North of England Railway Company, 11th August, 1840.

‡ Stockton and Darlington Committee Minutes, 14th August, 1840.

§ *Fourth Report on Railway Communication between London and Glasgow*, 1841.

|| Report by Robert Stephenson to Great North of England Railway Company, 7th September, 1841.

not only leave the West Coast route hopelessly behind in the race to Edinburgh, but be able to communicate with Glasgow by means of the railway to Carlisle and the coaching service beyond. A representative meeting, attended by deputations from the eight Companies chiefly interested in the East Coast route north of Rugby, was held at Newcastle on the 30th of April, 1841, George Hudson presiding, when a resolution was passed approving of the completion of the Great North of England Railway from Darlington to Thrislington and the formation of a separate line from the latter point to the Durham Junction Railway. After a fresh survey of the district by Robert Stephenson, a line was finally adopted which followed the course of the Great North of England Railway from Darlington to Brafferton and from Little Chilton to Thinford, but deviated from it between Brafferton and Little Chilton. From Thinford it followed more or less closely the course of the Northern Union Railway to the Durham Junction Railway, near Rainton Meadows. The remaining portion of the route was completed by existing railways, portions of the Stanhope and Tyne and Brandling Junction Railways being substituted for the Northern Union line between North Biddick and Heworth. A branch to Durham formed part of the scheme.

The new route was $7\frac{1}{2}$ miles longer than the Parliamentary line of the Great North of England Railway, but it united South Shields and Sunderland as well as Newcastle with Darlington, and could be opened for traffic much sooner, only $25\frac{1}{2}$ miles of railway (including a branch to Durham) having to be constructed instead of 31. According to the new scheme the Newcastle and Darlington Junction Railway was to be made by a separate company to whom the Great North of England Company should transfer about 15 miles of their Parliamentary line. The capital to be raised was £500,000 in shares of £25 each. The money market being depressed at this time, it seemed very doubtful whether the shares would be taken by the public at large. George Hudson, however, had a plan for forming a proprietary which met with general approval when submitted to the representatives of the companies directly interested in the new railway on the 6th of September, 1841. It was briefly this: that interest at the rate of 6 per cent. should be paid to the shareholders out of capital while the line was being made, and that, from the time of the opening, a lease of the line should be taken by these companies for a term of ten years, they guaranteeing a rent equivalent to the interest at 6 per cent. on a capital of £500,000, and having allotted to them shares in proportion to the amount of rent guaranteed. Arrangements with

the Great North of England Railway Company had assumed a definite shape and preparations were being made to apply to Parliament for an Act when a note of discord was struck by the Stockton and Darlington Railway Company who, thus far, had controlled the destinies of the Great North of England Railway. They felt aggrieved that the principle of making use of existing railways had not been applied in South, as well as in North Durham.* After having refused to co-operate with the Clarence Railway Company in the North Junction scheme, they now promoted a similar scheme of which John Harris, the engineer, was ostensibly the "onlie begetter." His first idea, which was communicated to the Stockton and Darlington Board on the 8th of October, seems to have been that a portion of the Stockton and Darlington Railway (5 m.) with a new line which he had surveyed, from Simpasture to Coldsides, one mile south-east of Rushyford, might be substituted for a portion of the authorised line between Darlington and the same point.† He subsequently recommended, probably in consequence of the deviations which Robert Stephenson was making in the Great North of England line, the construction of a line from Simpasture to Nunstainton (5½ m.) and the adoption of part of the Clarence Railway (3¼ m.) to Thrislington, showing that the making of this new line would complete a route to Thrislington from Darlington only a mile-and-a-half longer than the authorised line and render unnecessary the construction of seven miles of railway. Deputations from the Stockton and Darlington and Clarence Railway Companies met in conference on the 6th of November, when it was agreed that a combined effort should be made to secure the adoption of the scheme.‡ The advantages which the Newcastle and Darlington Junction Company would derive from Mr. Harris' plan were then made public. The *Gateshead Observer* and *Tyne Mercury* ventured to suggest that, perhaps, the motives of the Stockton and Darlington Railway Company were not quite disinterested.§ Brought before the Provisional Committee of the newly-formed company at York on the 29th of November the scheme was immediately rejected.|| Still holding to their purpose, the Stockton and Darlington Company began on the 30th of November, 1841, to convey passengers between Darlington and Coxhoe by way of Simpasture and Stillington, working the

* Circular to proprietors of Stockton and Darlington Railway, 14th January, 1842.

† Stockton and Darlington Committee Minutes, 8th October, 1841.

‡ *Ibid.*, 6th November, 1841.

§ *Gateshead Observer*, 27th November, 1841; *Tyne Mercury*, 30th November, 1841.

|| *Tyne Mercury*, 7th December, 1841.

traffic over the Clarence line with their own engines and carriages. They were unable, however, to come to a satisfactory arrangement with the Clarence Company, who "did not consider that the advantage likely to be derived from the temporary arrangement would be sufficient to warrant the expense of the alterations required,"* and the trains were discontinued on the 12th of February, 1842.† Having made further overtures to the Great



NORTH ENTRANCE OF SHILDON TUNNEL.

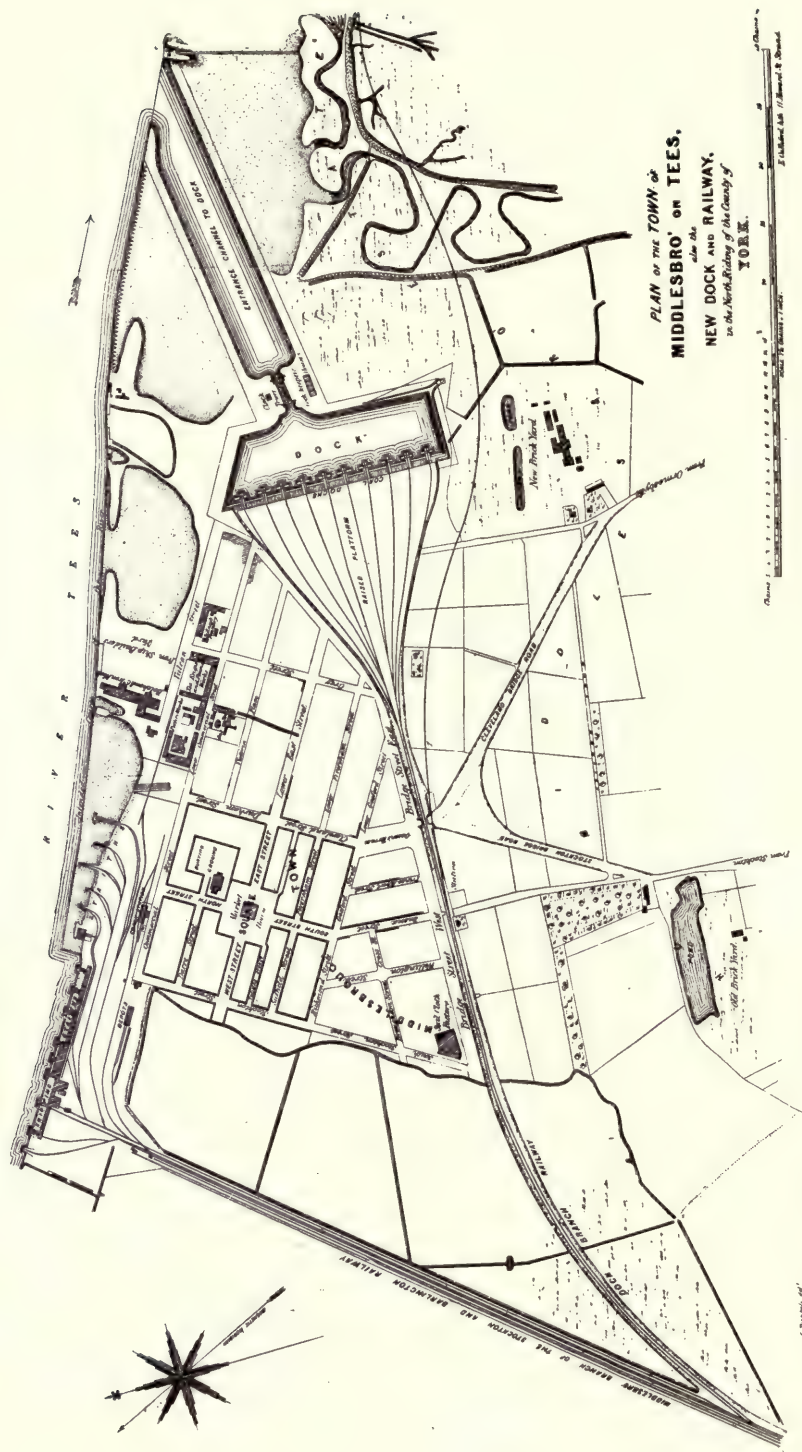
North of England and Newcastle and Darlington Junction Railway Companies without success, the Stockton and Darlington Company proceeded to deposit plans of their intended junction railway,‡ which now assumed the character of a competing line.

Meanwhile, about two miles of a new line from Shildon to Crook had been completed, including a tunnel through the Magnesian Limestone ridge

* *Gateshead Observer*, 26th February, 1842.

† Stockton and Darlington Committee Minutes, 11th February, 1842.

‡ *Gateshead Observer*, 5th March, 1842.



which divides the basin of the Tees from that of the Wear, a part by the Bishop Auckland and Weardale Company, and the rest by the Stockton and Darlington Company under the name of the Shildon Tunnel Company. Begun in April, 1839, and finished in January, 1842, the Shildon Tunnel, 1,225 yards in length, 25 feet 4 inches in height, and 21 feet in width, had been brought into use on the 19th of April, 1842,* when passenger trains began running through it to South Church. Arranging for a four-horse omnibus service between South Church and Rainton Meadows, the Stockton and Darlington Company inaugurated, on the 5th of May, 1842, a new route to the north, passengers being conveyed from Darlington to Newcastle by way of South Church, Rainton Meadows and Brockley Whinst† and *vice versa* in $3\frac{1}{4}$ hours for 8s. first-class and 6s. second-class. Anticipating a plan adopted on some modern lines, they placed a man at Darlington Bank Top Station to meet passengers from the south and persuade them to travel by the South Church instead of the coast route.‡

An important event very closely but not obtrusively connected with the scheme which the Stockton and Darlington Railway Company had taken up was the opening for trade on the 12th of May, 1842, of the Middlesbrough Dock. Having a water area of about 9 acres, the dock was capable of affording accommodation for 150 ships. There was a depth of 15 feet on the sill of the entrance lock at neap tides and of 19 feet at spring tides. This lock, 132 feet in length and 30 feet in width, was approached from the Tees by an entrance channel about a quarter-of-a-mile long, kept open by sluicing from the lock-gates and, also, from culverts built in the lock walls for that purpose. The branch railway from the Stockton and Darlington Railway near Newport terminated in ten diverging double lines covering a triangular raised platform 15 acres in extent, which afforded standing room for 1,200 loaded waggons. On the west side of the dock were 10 drops similar in construction to those at Port Clarence (see p. 239) and having a shipping power of 105 tons per hour. The cost of all these works—dock, railway, drops, etc., exclusive of land, was £120,000,§ the greater part of which had been advanced by the Stockton and Darlington Company with a view to the final acquisition of the dock.

By the Shildon Tunnel the Company had secured the shipment of all

* Report of Shildon Tunnel Company, 11th May, 1842. † *Tyne Mercury*, 26th April, 1842.

‡ Report of Meeting of Great North of England Shareholders in Newcastle, 11th December, 1842.

§ *Proc. Inst. Civ. Eng.*, vol. v., p. 248.

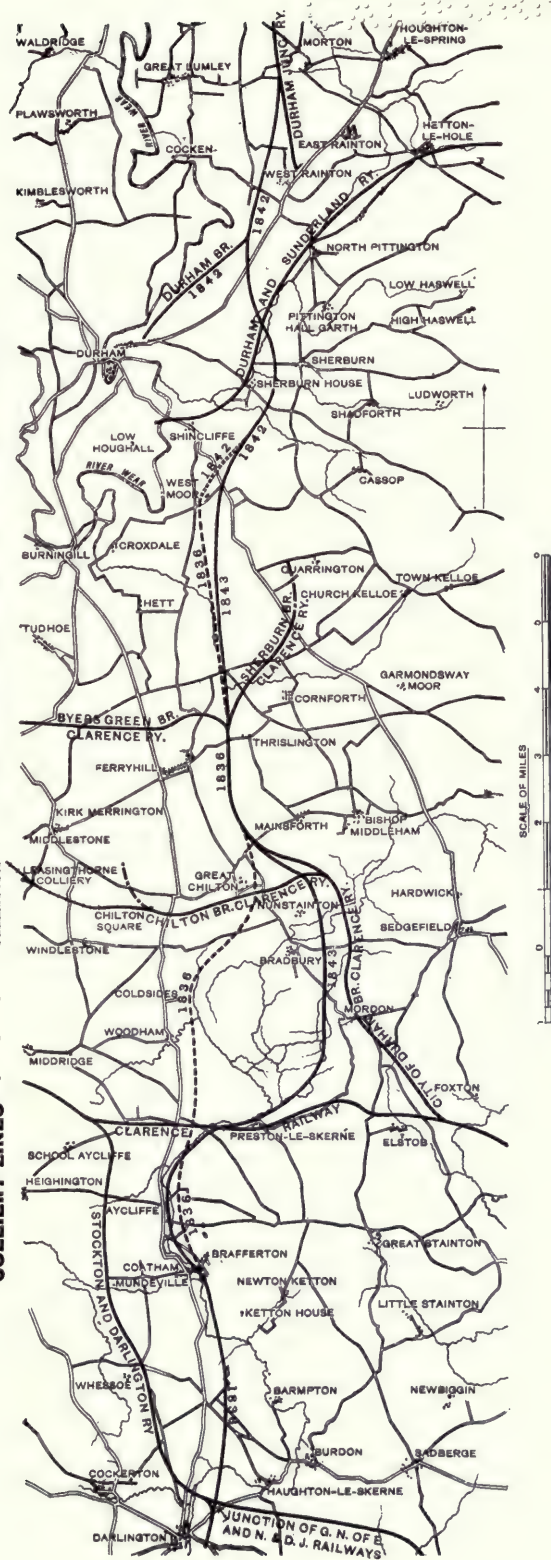
the coals from the neighbourhood of Crook and by this proposed Junction line they hoped to divert some of the West Durham and Coxhoe coals to Middlesbrough Dock and to levy dues upon them for a distance of 20 instead of 15 miles. The advocacy of the Stockton and Darlington plan by Joseph Pease, so plausibly and pertinaciously carried on, would no doubt have secured for it the favourable consideration of the Newcastle and Darlington Junction Board, if the policy of the new company had been directed by a lesser man than George Hudson. But George Hudson, laying down the principle that the trunk line between Darlington and Newcastle would have to be an independent line, practically shut the door on these proposals and, to make the exclusion more effectual, inserted a clause in the Company's Bill while it was pending in the House of Commons, prohibiting them from opening any portion of the line south of the Durham Branch until that portion of the Great North of England Railway lying between Darlington and Brafferton had been completed. The Stockton and Darlington Company opposed the Bill, covertly in the House of Commons* and openly in the House of Lords with the object, as the directors avowed, of affording an opportunity for the review of the subject when the question of the deviations proposed by Robert Stephenson should come before Parliament in the session of 1843.† As the Lords' Committee refused to allow them to be heard their opposition proved futile. The Dean and Chapter of Durham, who wanted a clause inserted in the Bill imposing a toll upon minerals carried upon the line, also opposed the Bill in both Houses with no more success than the Stockton and Darlington Company.‡ On the 18th of June, 1842, the Newcastle and Darlington Junction Company obtained their Act of Incorporation (5 and 6 Vic. Cap. 80), which empowered them to raise a capital of £500,000 in shares and £166,000 by loan. The railway authorised was:— (1) The original Great North of England line from Darlington to Shincliffe West House without the deviations and alterations of gradient of which notice had been given; (2) a line from Shincliffe West House to Rainton Meadows; and (3) the City of Durham Branch. A special clause provided for the completion of the branch to Durham. At least five companies had obtained powers to make a railway to Durham and all of them had failed to exercise these powers. It seemed as if Durham had been used merely as

* Statement by Joseph Watson, *Tyne Mercury*, 21st February, 1843.

† Report to General Meeting, 3rd August, 1842.

‡ Dean and Chapter of Durham *v.* Newcastle and Darlington Junction Railway Company, *Gateshead Observer*, 22nd October, 1842.

CONSTRUCTED
PARTIALLY CONSTRUCTED
NOT CONSTRUCTED



a stalking-horse under cover of which to secure Parliamentary privileges. When the Great North of England Company decided to abandon that portion of their line which passed close to Durham, the feeling in the city reached the point of ignition and one gentleman of the name of Ogden went so far as to obtain a rule of the Bail Court calling upon the Company to show cause why they should not immediately proceed to set out the railway from Darlington to Newcastle.* The branch now authorised was half-a-mile nearer the centre of Durham than the Great North of England line.

At the first meeting of the Newcastle and Darlington Junction Board† on the 7th of July, 1842, a deputation from the Stockton and Darlington Railway Company came forward with a new proposition. They tendered to the Company the uninterrupted use of 5 miles of their railway north of Darlington free of all charges for maintenance and repairs, etc., on the following terms viz. :—That the saving in the cost of construction effected by the use of their line being ascertained, the Stockton and Darlington Company should at the end of five years from the passing of the Act receive interest upon half the amount at the rate of 6 per cent. and, upon the expiration of the lease, at the rate of the dividends paid.‡ But the directors of the Junction Company were no more ready to accede to this proposition than to the former one and proceeded to stake out the line and open negotiations with the land-owners. In treating with the Dean and Chapter of Durham, they were met with the most exorbitant demands. This ecclesiastical body had sold land to the Great North of England Company for £9,000, and bought it back when the Company abandoned the line between Shincliffe and Gateshead for £1,300 without a spade having been put into it.§ They now repented of their moderation and for 50 acres of land required by the Junction Company claimed £12,000! Part of this land was for the Durham Branch, which the Dean and Chapter had themselves stipulated should be made. This was a last bold attempt on the part of the Dean and Chapter to secure compensation for the privilege of wayleave, which they had been accustomed to reserve in their leases. The Company offered £2,400, and a jury, to whom the matter was referred, awarded £3,500, viz., £2,500 (or £50 per acre) for the land and

* *Tyneside Mercury*, 23rd November, 1841.

† Directors appointed by the Act: Robert Davies, Robert Gill, John Hotham, George Hudson, James Oakes, Donatus O'Brien, Edward Oxley, Thomas Benson Pease, Nathaniel Plews, James Richardson, Charles Tee, William Woods.

First Chairman: George Hudson.

‡ *Gateshead Observer*, 6th August, 1842.

§ *Railway Times*, 1843, p. 900.

£1,000 for severance.* Contracts were let on the 17th November, 1842, for the northern portion of the line extending from Rainton to Shincliffe Grange and also for the branch to Durham.†

The Stockton and Darlington Company, in the words of their Secretary, now "authorised the insertion of the necessary Parliamentary notices with the view of affording to the Junction Company another opportunity, should they be so minded or advised, of carrying out their plans in the manner suggested."‡ The line of which notice was given was not quite the same as that previously proposed: it joined the Clarence Railway a mile further northward, on Mainsforth instead of Nunstainton Carrs. Several of the Great North of England shareholders resented this interference of the Stockton and Darlington Company in their affairs and even charged their directors with having failed to maintain the independence of their Board. A meeting convened by Mr. Joseph Watson, solicitor, of Newcastle, was held on the 10th of December to protest against the action of the Stockton and Darlington Company when a resolution was passed that "no gentleman holding office in the Stockton and Darlington Company ought to continue to act in a similar capacity in this Company," and an address, prepared by Mr. Watson, was ordered to be circulated among the shareholders.§ A counterblast to the address appeared on the 16th of December in the form of a letter by Samuel Barnard, the secretary, to the shareholders of his Company, and, on the 28th, William Cubitt, whose opinion had been invited on the subject, reported in favour of the Stockton and Darlington plan. Referring to the substitution by Robert Stephenson of the portions of the Stanhope and Tyne and Brandling Junction lines for the northern line of the Northern Union Company, he asked "if it be advisable on the north side of Shincliffe Grange to use about $7\frac{3}{4}$ miles additional of old line instead of making 5 miles of new, sacrificing at the same time $2\frac{3}{4}$ miles of distance, why should it not be equally desirable on the south side of Shincliffe Grange to use 7 miles of old line instead of making $6\frac{1}{2}$ miles of new and sacrificing only half-a-mile of distance?" Early in January, 1843, however, the competing line was withdrawn and on the 12th of the month the contracts were let for the works between Darlington and Brafferton.|| The works on the first contract

* Dean and Chapter of Durham v. Newcastle and Darlington Junction Railway Company. *Gateshead Observer*, 22nd October, 1842.

† *Yorkshire Gazette*, 19th November, 1842.

‡ Letter to the Shareholders, 16th December, 1842. § *Tyne Mercury*, 13th December, 1842.

|| *Durham Advertiser*, 20th January, 1843.

in the neighbourhood of Durham were begun on the 25th of January, 1843.* On the 16th of April the Company obtained Parliamentary sanction to make the three extensive deviations, recommended by Robert Stephenson, and to abandon a portion of the Great North of England line rendered useless by these deviations and, on the 11th of May, the remaining contracts for the works between Brafferton and Shincliffe were let.†



From the "*Illustrated London News*," July 20th, 1844.

SHERBURN VIADUCT.

During the two years which had elapsed since the projection of the Newcastle and Darlington Junction Railway, a crisis had occurred in the affairs of two of the companies concerned in the East Coast Route—the Stanhope and Tyne and Brandling Junction Railway Companies: the former one had drifted into a state of bankruptcy, the latter was on the verge of it. It

* *Great Northern Advertiser*, quoted in *Railway Times*, 1843, p. 1283.

† Minutes of Newcastle and Darlington Junction Railway Company, 11th May, 1843.

was towards the end of 1840 that the shareholders of the Stanhope and Tyne Railway Company first came to a knowledge of their real financial position. They then found that, in the management of their affairs, every principle of sound finance had been thrown to the winds. While the paid-up capital of the Company was only £150,000, the debts and liabilities amounted to £440,000, that is to say, instead of the sum borrowed being, as in the case of companies incorporated by Act of Parliament, one-third of the share-capital, it was three times the amount of the capital, exceeding the limit fixed in the Deed of Settlement by £290,000. Much of the money had been raised by means of accommodation-bills on terms averaging 11 per cent. per annum; * transactions of this nature being no doubt facilitated by the several representatives of banking houses connected with the Company. These bills were constantly in circulation and the amount yearly paid in discounts could not be far short of £20,000† which, together with the large sums payable for wayleave, constituted a heavy charge against the revenue. An expanding revenue might have saved the Company, but at this important juncture several sources of income failed them. Owing to the expense of working the upper part of the line—between Stanhope and Carrhouse—they had been obliged to close it and give up the making of lime, though still paying rent for the quarries and wayleave charges for the line. Then, in November, 1840, they lost by competition the traffic from Tanfield Moor Colliery which represented in dues about £5,000 a year.‡ Creditors become clamorous, holders of bills for which the Company were responsible refused to renew them, and many of the shareholders learnt for the first time that, under the deed of settlement they were personally liable for the whole of the debts of the co-partnery. At an extraordinary general meeting of the Company, held on the 29th of December, 1840, a scheme was propounded by which individual proprietors might be saved from ruin, but at the sacrifice of the original capital. It was proposed to dissolve the Company, vesting its property in a new company which should be formed with a capital of £400,000 for the purpose of liquidating the existing debts and carrying on the concern, this capital to be raised as far as possible by subscriptions among the shareholders of the old Company. Those proprietors who were unwilling to risk any further sum of money in connection with the railway would simply drop out, escaping from their liabilities with the loss of their shares.§ This plan of

* *Life of Robert Stephenson*, 1864, vol. i., p. 219.

† Richard Till. Evidence on Stanhope and Tyne Railway Bill, 10th March, 1842.

‡ N. Wood. Evidence on Stanhope and Tyne Railway Bill, 10th March, 1842.

§ *Local Records of Gateshead*, 1842, p. 454.

retrieval was adopted at an adjourned meeting of the Company on the 2nd of January, 1841. By the 12th, £250,000 had been subscribed towards the capital proposed and shortly afterwards a substantial instalment was paid into the coffers of the Company.* The dissolution of the old Company took place on the 5th of February, 1841. At this time their assets, which included more than half the shares of the Durham Junction Railway Company, did not exceed on a liberal computation £307,883 and their liabilities amounted to £440,852,† consisting of debentures, £163,000; Alliance Assurance mortgage and interest, £61,500; bills running and overdue, £118,909; overdrafts at various banks, £63,773; and sundry unpaid tradesmen's accounts, arrears of interest, etc., £33,670.‡ Of the 49 proprietors of the Stanhope and Tyne Railway, 25 became shareholders in the new Company. The capital raised among them amounted to £339,800 by means of which their liabilities were reduced by £215,583 in less than a year.§ Early in 1842, the Company freed themselves from certain entanglements and burdens, assigning to Edward Richardson a share which they had covenanted to hold in the Derwent Colliery,|| and entering into an agreement with the Derwent Iron Company for the sale to them of the upper part of the line and the quarries at Stanhope.¶ An Act was now required to sanction the arrangements made and to provide for the working, under Parliamentary authority, of a portion of the old line, viz., 24½ miles. It was not obtained without a struggle. Opposition came from two of the original projectors of the railway. They had commuted in 1836 their interest in the profits for a substantial batch of debentures and shares** and now they protested against the obliteration of these shares.†† “They represented, says Mr. J. C. Jeaffreson, “that the Pontop and South Shields scheme was simply a conspiracy on the part of the rich to oust the poor shareholders from the undertaking just as it was about to become profitable.” “Absurd as such a charge was,” he adds, “it gained so much credit that, on the second reading before the Lords, Lord Canterbury denounced the Bill as a measure of spoliation.”‡‡ On the 23rd of May, 1842, the subscribers to the new Com-

* *Life of Robert Stephenson*, vol. i., p. 249.

† *Ibid.*, p. 248.

‡ Evidence on Stanhope and Tyne Railway Bill, 1842; *Local Records of Gateshead*, 1842, p. 43.

§ Richard Till. Evidence on Stanhope and Tyne Railway Bill, 1842.

|| Deed of Assignment.

¶ Wear and Derwent Railway Papers.

** Richard Till. Evidence on Stanhope and Tyne Railway Bill, 1842.

†† *Local Records of Gateshead*, 1842, p. 44. ‡‡ *Life of Robert Stephenson*, vol. i. p. 205.

pany obtained their Act (5 Vic. Cap 27) which incorporated them under the title of the Pontop and South Shields Railway Company, and on the 29th of August they held their first general meeting when Robert Stephenson was elected chairman.

It was probably this crisis in the affairs of the Stanhope and Tyne Railway Company which suggested the inquiry into the affairs of the Brandling Junction Railway Company. A Committee of Investigation, appointed on the 6th of May, 1842, spent the greater part of the year in unravelling the accounts and reviewing the transactions of the Company. They found that, so far from the Brandling Junction Railway being a lucrative concern, it was really not paying its way.* Dividends had, it is true, been declared—two of them at the rate of 6 per cent.—but they had all been paid indirectly out of capital. It had been the practice of the directors to “arrange” the accounts at the end of the half-year, so that they might give the appearance of a profit. This operation consisted in carrying to the formation account (1) the interest upon the purchase-money of property not actually in use for the purposes of the railway—in one half-year, even a portion of the interest on bonds and debentures and (2) certain of the purely revenue charges, such as coals for the stationary engines, repairs of locomotive engines, wages of smiths, enginewrights, joiners, etc.† The large amount paid for interest was the result of the directors’ policy in restricting the issue of shares, after 3,241 had been allotted, in order not to depress the market value of their stock. The money required for completing the works they had raised on their personal bonds, subsequently vesting in themselves and mortgaging to themselves the remainder of the shares unissued, viz., 2,759, as security for the liabilities incurred and for further sums of money intended to be borrowed.‡ On account of the procuration-money and other legal expenses and stamps this mode of raising capital was an expensive one, besides fixing on the Company an annual charge for interest amounting in 1842 to £16,460 which had to be paid whether the shareholders got any return for their money or not.§ In consequence of the light thrown on the affairs of the Company their shares fell in the market upwards of 50 per cent.|| For the shareholders this was a rude awakening from a pleasant dream. This change of fortune led them to reform their system of manage-

* *Report on Affairs of Brandling Junction Railway Company, 1843. Appendix No. 1.*

† *Ibid.* Appendix No. 43.

‡ *Ibid.*, pp. 12 and 13.

§ *Ibid.*

|| *A Brief History of the Brandling Junction Railway, 1845, p. 17.*

ment and perhaps to take an unduly modest view of the value of their property. During the progress of the investigation, the Company had begun carrying passengers—on the 18th June, 1842—between Tanfield Lea and Gateshead and completed the extension of their line from the west end of South Shields to the centre of the town, a distance of $\frac{7}{8}$ m., opening, on the 17th December, 1842, a new passenger and goods station at Heron's Hill



Photo by

FELLING STATION.

Frank & Sons, Gateshead.

BRANDLING JUNCTION RAILWAY, 1842.

within a short distance of the steam-ferry and the market-place and substituting for the old station at West Holborn a small station in Wreken Dyke Lane called Grewcocks, or the High Station.

Of the three Companies with which the Newcastle and Darlington Junction Company was connected there remained but one whose affairs had not been subjected to a public examination—yet behind the directors of the Durham Junction Company, as well as behind those of the other companies,

sat black Care. The proceeds of the railway had not been sufficient, one year with another, to pay the working expenses and contingent charges. The debt of the Company was consequently increased by the accumulation of interest until it reached a total amount of £20,000. One of the larger creditors had obtained a judgment against them and it was only the payment of several thousand pounds obtained on the personal credit of some of the shareholders which prevented him from proceeding to execution. At this crisis in their affairs they were faced with the necessity of expending a further sum of £12,000 in laying down heavier rails, the original ones being too light for the traffic of a trunk line. To raise this additional capital was quite out of their power and they proposed to Mr. Hudson that his Company should purchase the line. The price asked was £100,000, but Mr. Hudson refused to give more than £88,500, the actual cost of the line, and, on the 14th September, 1843, these terms were accepted by Robert Stephenson, on behalf of the Durham Junction Company.* The sale of the railway at this price meant, when all liabilities were discharged, a loss of £11 or £12 per share and the sacrifice of interest for 8 or 9 years.

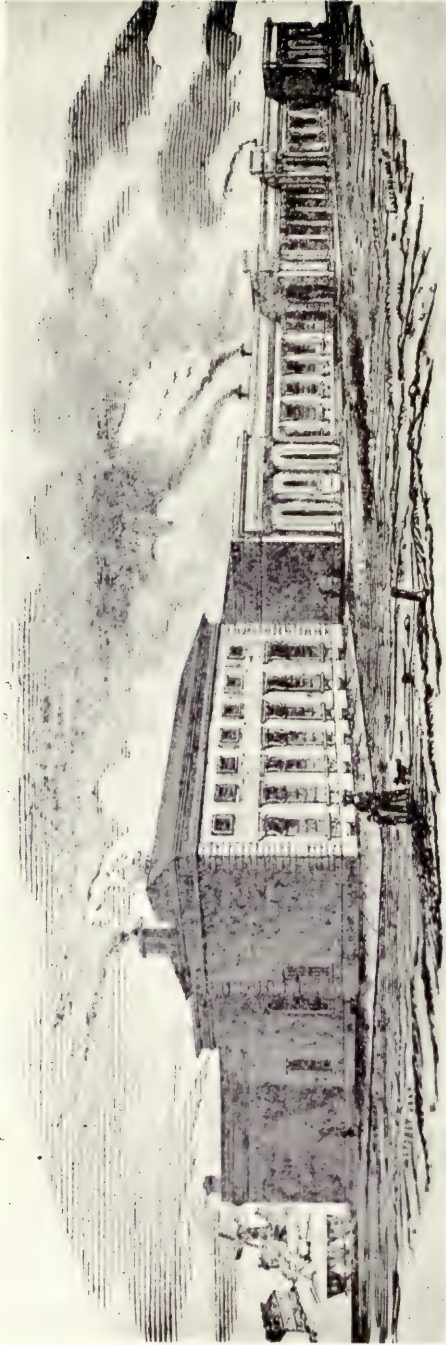
At the request of the Newcastle and Darlington Junction Company, who now felt strong enough to stand alone, the guaranteeing companies consented to cancel the arrangement giving them the right to lease the line and pocket the surplus profits. With the control of the undertaking in their own hands the Company were in a better position to take measures for the extension of the line northward. A prospectus was already in circulation for the purpose of forming a company to connect Berwick by railway with Edinburgh and it was imperative that the Newcastle and Darlington Junction Company should lose no time in completing the last link in the great chain of communication. How to carry the railway across the Tyne was the question of questions, which once more came urgently to the front. Scheme after scheme had been suggested for crossing the river, from Bill Quay eastward to Dunston westward, and the problem was still unsolved. George Stephenson had expressed his opinion that the best situation for a high level bridge was between the Castle Garth, Newcastle, and Greenesfield, Gateshead, and a company was being formed for the purpose of constructing a bridge in this situation according to the designs of Messrs. John and Benjamin Green. At the suggestion of Mr. Hudson, it was resolved to support this Company by guaranteeing a dividend, the proposal being to pay

* *Newcastle Town Council Proceedings*, 1845, pp. 418-419.

for the use of the bridge an annual rent equivalent to 3 per cent. on the cost of construction (not to exceed £100,000) as a composition for the tolls on railway traffic. George Hudson and George Stephenson joined the Committee of Management and Robert Stephenson was appointed consulting engineer. The Newcastle and Carlisle Company had never wavered in their belief that the Tyne would be crossed at Redheugh and on that supposition had purchased ground west of the Forth Banks for a great joint station. They still entertained the idea that the great north line might be diverted westward from Newcastle. Little public support, it is true, had been given to John Blackmore's inland line which branched off at Hexham, but another line had been suggested by their committee of management, Messrs. Johnson and Wood, diverging from the Carlisle Railway near Gilsland. Designed to supersede, not only the East Coast line from Newcastle, but also the West Coast line from Carlisle, the central line into Scotland, as it was called, was so situated that all the traffic between London and Edinburgh, whether by Newcastle or Carlisle, would have passed over portions of the Newcastle and Carlisle Railway. With such interests at stake, they made ready to dispute the passage of the Tyne. George Stephenson, who regarded the integrity of the East Coast route as a matter of national importance, did not wait for the Newcastle and Carlisle party to mature their plans. Addressing a letter to Mr. Hudson on the 1st November, 1843, he showed how, by adopting the central line, the Companies interested in the East Coast route would give up the advantages possessed by them and deliberately play into the hands of their West Coast rivals. "If," he said, "the line is diverted from the East Coast both England and Scotland will hereafter regret it," a prediction to which he gave a rhetorical flourish by adding "Please to put this letter by and look at it four years hence."* After such an expression of opinion there was no disposition to re-open the question of route. It was clear that the Tyne would have to be crossed at the point indicated by George Stephenson and the line carried by viaducts to the Newcastle and North Shields Railway.

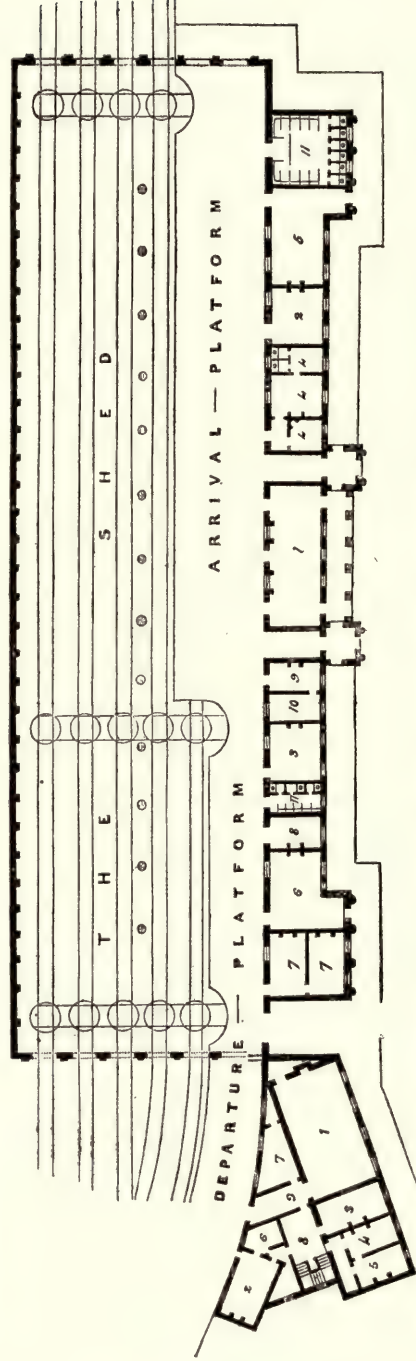
While these questions were occupying the attention of the Newcastle and Darlington Company, the Brandling Junction Company were busy enlarging the gathering-area of their traffic by means of private railways. By means of the Pelaw Main waggonway they drew traffic from Birtley and Urpeth, by means of the Springwell waggonway they conveyed

* Minutes of Newcastle and Darlington Junction Railway Company, 9th November, 1843.



From "Newcastle Journal," June 22nd, 1844.

J. Storey, Junr., del.



From "Gateshead Observer," June 22nd, 1844.

VIEW AND PLAN OF GATESHEAD STATION.

- (1) Booking Office. (2) First-class Waiting-room. (3) Second-class Waiting-rooms. (4, 4, 4) Ladies' Waiting-rooms. (5) Post Office for reception of mail bags. (6) Parcels Office. (7, 7) Clerks' Offices. (8) Lamp-room. (9) Station Master's Office, with rooms above. (10) Lost Luggage Office. (11) Conveniences.

passengers to and from Jarrow by horse power and by means of a short junction line ($1\frac{1}{4}$ m.) between Harelaw and Tanfield Moor opened on the 26th December, 1843, by the Derwent Iron Company,* they obtained lead and lime from the western portion of the old Stanhope and Tyne Railway and gained access to the newly-founded Consett Ironworks. They made a short branch at South Shields ($\frac{3}{4}$ m.) to Metcalf's Dock from which they began shipping coals in the spring of 1844—relinquishing Archer's Quay—and by arrangement with the Pontop and South Shields Company, they secured the whole of the south traffic in passengers and goods between Brockley Whins and South Shields.

On the 15th April, 1844, a portion of the Newcastle and Darlington Junction Railway between Rainton Crossing and Belmont Junction ($2\frac{1}{2}$ m.) and the City of Durham branch ($2\frac{1}{4}$ m.) were opened for traffic. On the 23rd May the Company obtained their second Act which sanctioned the purchase of the Durham Junction Railway and the withdrawal of the guaranteeing companies from their agreement and gave power to erect a station at Gateshead and build a high-level bridge over the Tyne. At the same time the Pontop and South Shields Company obtained power to lay down a third line of rails between Washington and Boldon for the exclusive accommodation of the Newcastle and Darlington traffic and to form, in conjunction with the Brandling Junction Company, a branch line from Boldon to Brockley Whins. The whole line was now traversable and, on the 24th May, a special train drawn by the "Cleveland" engine, conveyed the directors from York to Gateshead.† The railway had been constructed in an exceptionally short time and at a cost of less than £15,000 per mile, though the earthwork had averaged 70,000 cubic yards per mile. The principal cutting was 80 feet in depth, through the interesting series of Permian rocks at Ferryhill. An embankment raised on 3-inch planks carried the railway over a tract of boggy ground lying between Preston-le-Skerne and Bradbury called "Mordon Carrs."

The principal novelties of construction were three timber viaducts between Shincliffe and Sherburn, consisting of upright baulks 20 feet apart, supported by diagonal braces, and bound together by cross-beams, on which were laid the longitudinal way-beams. The finest of these viaducts was that over the Sherburn Valley, 660 feet in length and 70 feet in height in the centre.‡ They were described by the editor of the *Railway Chronicle* as amongst the finest specimens of the adaptation of timber to

* *Gateshead Observer*, 29th December, 1843.

† *Gateshead Observer*, 25th May, 1844.

‡ *Ibid.*, 22nd June, 1844; *Illustrated London News*, 1844, p. 44.

bridge building, which, up to that time, had been designed.* The station in Gateshead, designed by G. T. Andrews, of York, occupied a commanding site in Greensfield, overlooking the river, its fine Ionic front facing the north. There were only two platforms, covered by a light iron-roofed shed 352 feet long and 88 feet wide. The building, which now contains the offices of the chief mechanical engineer, was formerly the station hotel.

On the 18th June, 1844, the public opening of the line took place and was signalled by what was then considered an extraordinarily rapid journey. A special train, conveying the Hon. H. T. Liddell, M.P., and eight other gentlemen, left Euston Square at 5.3 a.m. and arrived at Gateshead at 2.24 p.m. The train was in motion 8 hours 11 minutes, running at an average speed of 37 miles an hour. Over the new line it was drawn by the "Cleveland" engine. Three trains of six carriages each, drawn respectively by the "Nathaniel Ogle," the "Brandling" and the "Mountain" engines, left Gateshead for Darlington at 9.5 a.m., preceded by the "Edinburgh" engine as pilot. On the arrival of a train from York conveying Mr. Hudson and a large party of railway directors and others, a processional train was formed consisting of thirty-nine first class carriages (one of which was the "Gondola" described on page 351), drawn by three engines, the "Wear," the "Glasgow" and the "Edinburgh." After stopping at Sherburn to allow the company to inspect the viaduct, and spending some time at Brockley Whins in getting from the Stanhope and Tyne to the Brandling Junction line—the new curve not being finished—the train arrived at Gateshead about 4.30 p.m. It was followed a few hours later by two of the Brandling trains, which had remained at Darlington until 5 o'clock.†

The day formed a landmark in railway history. A feat had been performed of which the East Coast party were justly proud. Never, as George Hudson observed in replying to an address from the Gateshead Corporation, had 303 miles been travelled in so short a time. At the dinner provided by the Company in Newcastle at the Assembly Rooms, those who had made the famous journey had yet another memorable experience, that of hearing from the lips of George Stephenson himself the story of the building of the first Killingworth engine, 30 years before, and of listening to a speech by John Bright on the far-reaching social and economic

* *Railway Chronicle*, 1844, p. 231. For elevations and cross-sections of the Sherburn Viaduct engraved from Mr. Harrison's drawings, see pp. 246 and 294 of this volume of the *Railway Chronicle*. There is a fine oil-painting of the viaduct by Carmichael.

† *Gateshead Observer*, 22nd June, 1844.

effects of railways. One fact it is interesting to place on record, that at the time of this famous celebration, two of the members of the staff at Gateshead, were men who have since played a conspicuous part in the management of railway affairs—one was Mr. (afterwards Sir) James Allport, appointed five months before “to superintend the traffic and management of the Junction lines;” the other was Mr. Henry Tennant who, a month later—on the 21st February, 1844—had entered the service of the Brandling Junction Railway Company. The railway was opened to the public the following day, the traffic being worked by the Great North of England engines. The time occupied by the first train from London was $12\frac{1}{2}$ hours (time in motion, $9\frac{3}{4}$ hours, stoppages, $2\frac{3}{4}$ hours).*

A month's working of the railway sufficed to show the evil of divided management, and George Hudson therefore opened negotiations with the Directors of the Brandling Junction Railway for the purchase of their line. Failing to come to an agreement with them, the Railway King gave instructions for surveys to be made for an independent line from Washington to Newcastle, 13 miles in length, which would shorten the distance by 3 miles, and, at the half-yearly general meeting of his Company, on the 5th August, he set forth the advantages of the new line, adding significantly that the Newcastle and Darlington Company would have purchased the Brandling Junction line but the price asked was so much above its value, in fact so extravagant, as to render that step impracticable.† Thoroughly alarmed, the Brandling directors abated their demands and eight days afterwards—on the 13th August—Hudson got the line on his own terms. According to the agreement, which was made on a sheet of letter-paper in the Queen's Head Inn, Newcastle, the purchaser was to have possession of the line on the 1st September, with a right to the net receipts from the 1st July, paying £55 for each £50 share, and taking upon himself all the liabilities and engagements of the Company.‡ George Hudson bought the railway in his own name and on his own responsibility, but on the 16th he transferred the bargain to the Newcastle and Darlington Junction Company, receiving as a consideration the promise of an allotment of 500 of the new shares proposed to be issued as soon as the purchase should be legalised by Act of Parliament.§ On the 19th August, 1844, the curve between Boldon and Brockley Whins ($\frac{1}{2}$ mile) which had been constructed

* *Life of Thomas Sopwith*, 1891, pp. 215-216.

† *Railway Times*, 1844, p. 871.

‡ *Herapath's Journal*, 1845, p. 268.

§ Minutes of Newcastle and Darlington Railway Company, 16th August, 1844.

at the joint expense of the Pontop and South Shields and Brandling Junction Companies was brought into use. The Newcastle and Darlington Company duly took possession of the Brandling Junction line on the 1st September and, on this date, they closed the old Oakwellgate station in Gateshead for passenger traffic. The same energy which had been displayed in the construction of the railway was now exhibited in the working of the traffic. All through the month of September cheap trips on a big scale were run between Darlington and Gateshead for 3s. 6d., 2s. 6d., and 1s. 6d., and between York and Gateshead for 5s., 4s., and 3s. In the southern part of the North Eastern territory "one of the most monstrous of monstrous trains ever recorded" to quote the *Leeds Mercury*, ran in four divisions on the 17th September, conveying passengers to the number of 7,800 from Leeds to Hull and back, and in the northern part of this territory, on the 23rd, an enormous train of 72 carriages drawn by six engines, passed over the newly opened line, carrying nearly 3,000 passengers from Gateshead, South Shields and Sunderland to York. The spirit of railway enterprise was abroad, the day of small things was past.



MEDAL TO COMMEMORATE OPENING OF HIGH LEVEL BRIDGE.

To face page 453.

PLATE XXIII.



Francis Grant, A.R.A., pinx.

George Raphael Ward, sc.

George Hudson.

CHAPTER XIII.

CONSOLIDATION AND EXPANSION, 1844-8.

The autumn of 1844 marks the beginning of the great railway mania which had so disastrous an effect on the commercial life of the country. At this time King Hudson was at the height of his power, extending his dominions and securing them from invasion. He had succeeded in uniting the North Midland, Midland Counties and Birmingham and Derby Junction Companies and was chairman of the great Company which had taken their place. He was chairman of the York and North Midland Company which, already empowered by Acts passed in May and July, 1844, to purchase the Leeds and Selby Railway and make a line to Scarborough and Pickering, had formally agreed to purchase the Whitby and Pickering Railway; he was chairman of the Newcastle and Darlington Junction Railway Company and also of the Company formed to carry the trunk line northward from Gateshead to Berwick. This concentration of power in the hands of a great railway tactician secured unity of policy and management from Rugby to Berwick and resulted in the rapid consolidation of railway interests throughout the three northern counties. It was owing to this unity of policy, as well as to the great personal influence of Mr. Hudson, that the North British Company, unable to go to Parliament for want of the requisite amount of capital, received an application from the York and North Midland Company for 2,000 shares, representing a subscription of £50,000, and that, in order to raise the capital for forming the line of railway from Newcastle to Berwick, the Newcastle and Darlington Junction Company engaged to take a perpetual lease of the railway at a rent sufficient to pay to the subscribers 5 per cent. per annum on the amount of capital invested, giving them, however, the option at any time within three years after the opening of the railway of determining the lease.

At this time the interests of the Companies which he controlled were menaced by competing projects. On the south the London and York—the Great Northern—scheme, which was being pushed forward with much energy, threatened to divert traffic from the York and North Midland and

Midland lines. This line was crossed by the Wakefield, Pontefract and Goole Railway, projected under the auspices of the Manchester and Leeds Company, who had made arrangements with the London and York Company for the use of a part of their line to Selby. Now, since the 1st of January, 1844, the Manchester and Leeds Company had been in friendly alliance with the Hull and Selby Company, the traffic on both lines being worked jointly under an arrangement which contemplated a union of the nature of a partnership between the two Companies. The whole line from Hull to Manchester under one management, quite independent of the York and North Midland Railway, with vastly greater power in the hands of the Manchester Board to make terms with the Aire and Calder Company—that was not a “consummation” which, in the opinion of George Hudson at least, was “devoutly to be wished.” On the south-west there was also a danger of competition, for the people of Leeds, wanting a northern outlet for their traffic, had issued in May this year the prospectus of a railway from Leeds to Thirsk. Probably aware that the Great North of England Company had made a survey in September, 1843, for a line from Pilmoor to Boroughbridge, Knaresborough and Harrogate, with a branch to Ripon, and rightly divining that this Company did not intend facing the engineering difficulties between Harrogate and Leeds, they had decided to make a line of their own. In the north a rival Company had been formed for the purpose of making the “Northumberland Railway,” which was intended to commence at Gateshead, cross the Tyne at Redheugh, and pass through Newcastle by a tunnel, 2,410 yards in length, and then proceed northward, crossing the Blyth east of Stannington Bridge, the Wansbeck at Morpeth Banks, the Coquet at Morwick, the Aln near Lesbury, and from the Aln to the Tweed, following nearly the course of the present line.

The circumstances attending the projection of the Northumberland Railway were these. The original line laid down by George Stephenson between Newcastle and Berwick ran through Bedlington and Warkworth and then hugged the shore, passing between the “Long Walk” at Howick and the sea. Earl Grey protested against this railway intrusion and, when the Newcastle and Berwick scheme was revived in the spring of 1844, Lord Howick called upon George Stephenson in London, and, insisting that “private property must be respected,” suggested that the line should be carried to the westward of Howick. This alteration George Stephenson declared to be impracticable on the ground of expense. Neither George Hudson nor Robert Stephenson thought it expedient to deviate from the

original line, and Lord Howick, knowing that Parliament would be unwilling to listen to any opposition on the plea of personal inconvenience, set to work to promote a rival company.* A company formed for the purpose of achieving a purely personal object could not hope to appear in a very heroic light, but when the promoters came forward as the champions of the atmospheric principle of propulsion, boldly declaring their belief that this system of working railways would, at no distant period, supersede that actually in use, the situation was changed! In consequence of this hostile measure Mr. Hudson directed fresh levels to be taken, and on the 31st July he was informed that another line could be constructed, although with inferior gradients and at a very considerable outlay of money. He wrote at once to Lord Howick stating that the Company were prepared to meet Earl Grey's wishes and carry the railway west of the Howick grounds, but the concession came too late. Lord Howick was already committed to the rival scheme, and could not break faith with those who had promised to support him.†

The projection of this competing line did not interfere with the development of Mr. Hudson's plans. In November he made a provisional agreement with the Newcastle and North Shields Railway Company for the amalgamation of that Company with the Newcastle and Berwick Railway Company, the arrangement being that, until the opening for traffic of some part of the Newcastle and Berwick Railway, the Newcastle and North Shields Railway should be managed as an independent line unless the Newcastle and Berwick Company should exercise the power reserved to them of requiring the amalgamation of the two Companies at an earlier period. According to the terms of the agreement, a shareholder in the Newcastle and North Shields Company might dispose of his shares to the united Company at par or take shares in that Company to the same amount also at par.‡ The idea of having a high level bridge built by a separate Company had now been abandoned, the Newcastle and Darlington Junction and Newcastle and Berwick Companies having agreed to erect it at their joint expense. The site of the bridge had been fixed and the direction of the lines through Newcastle settled—one from Castle Street to a great Central Station south of Neville Street, the other from Clavering Place across Dean Street, Pilgrim Street and Manor Chare to the Newcastle and North Shields Railway. On the 30th December, 1844, George Hudson met the Town Improvement Com-

* Lord Howick's evidence on Northumberland Railway Bill, *Tyne Mercury*, 2nd July, 1845; Lord Howick's Circular, *Railway Times*, 1844, p. 1276.

† Speech by George Hudson, *Railway Times*, 1844, p. 870. ‡ *Railway Times*, 1844, p. 1412.

mittee of Newcastle and laid his plans before them. As a guarantee that these costly works should be executed, he proposed, voluntarily, to have a clause inserted in the Bill depriving the Company of power to take toll on any part of the line between Newcastle and Berwick unless the bridge over the Tyne and the lines through the town were completed within five years from the passing of the Act, and, the following day, he wrote to the Committee, engaging that the bridge should be made available for horses, carriages and foot passengers as well as for railway carriages.* A few days afterwards the Newcastle Corporation decided unanimously to support the Newcastle and Berwick Bill.

To frustrate schemes which threatened his interests on the south, Mr. Hudson projected, in opposition to the Wakefield, Pontefract and Goole Railway, a line from Selby to Goole, and a series of lines which were intended to supersede part of the London and York scheme, viz., in connection with the Midland Railway, a line from Syston to Peterborough, 48 miles; a second from Lincoln to Ely, 72 miles; a third from Nottingham to Lincoln, 33 miles; and a fourth from Swinton to Lincoln, 38 miles; and, in connection with the York and North Midland Railway, a line from Milford to Doncaster, $18\frac{1}{2}$ miles, to join the Swinton and Lincoln line. A stroke of good fortune placed the Hull and Selby Railway in his hands. Some of the shareholders of the Hull and Selby Company, it appeared, did not look favourably upon the Manchester alliance, and in October, 1844, two of them—Thomas MacTurk and James Mayelston—started an agitation for a revision of the terms of the agreement. Certain protective arrangements with other companies had been made and were contemplated by the Manchester and Leeds Company, and these, it was felt on both sides, would require a readjustment of the proportions in which the net receipts were divided between the two associated companies. The fears of some of the directors of the Hull and Selby Company, who held shares in the Hull Dock Company, had been unduly excited by the ingenious representations of the Manchester board with reference to the proposed establishment of docks at Wakefield and the possible capabilities of Goole,† and they readily assented to a scheme of amalgamation proposed to them, embracing also the Wakefield, Pontefract and Goole and Leeds and West Riding Junction Railways. A meeting of the shareholders, held on the 22nd February, 1845, for the purpose of considering this proposal for a quadruple alliance, was adjourned for a fortnight pending the arrival of a report from the Board

* *Proceedings of Newcastle Town Council*, 1845, pp. 74 and 75.

† *MacTurk's History of the Hull Railways*, 1879, p. 82.

of Trade on the proposed union.* Three days before the meeting, a deputation from the committee of dissentient shareholders, headed by Sir William Lowthrop, waited upon Mr. Hudson at York and asked him to communicate to them unofficially the terms on which the York and North Midland Company might be disposed to take a lease of their line.† Here was presented the very opportunity which Mr. Hudson wanted for upsetting the schemes of the Manchester and Leeds Company, and he was not the man to allow it to slip.

The Hull and Selby Company were at this time seeking powers to make a branch line to Bridlington—a town and port which the York and North Midland Company had decided to connect with their system by means of a branch from Scarborough, and they were projecting another branch line through Market Weighton and Pocklington to a junction with the Great North of England, York and North Midland or any other railway or railways at or near York.‡ While willing that they should remain independent, he was not prepared to let them fall into the hands of a Company who might have interests opposed to those of the York and North Midland Company and, therefore, boldly decided to outbid the Manchester and Leeds Company, proposing to take a perpetual lease of the Hull and Selby Railway and the intended branch at an annual rent of 10 per cent. on the capital with the option of purchase at the rate of £100 for every £50 share and so in proportion for the other shares.§ At an adjourned meeting of the Hull and Selby Company on the 7th of March, 1845, a resolution was carried in opposition to the directors, who still felt bound to continue the negotiations|| with the Manchester and Leeds board. On the 9th of April the shareholders passed resolutions in favour of the York alliance and, at a special general meeting held on the 2nd of May, decided—again in opposition to the directors who wished the line to remain in an independent position—to offer the line to the York and North Midland Company on the following terms:—A lease in perpetuity at a rent of 10 per cent. per annum on the original share capital—10 per cent. on the half-share capital (created for the Bridlington branch) so soon as that line should be opened, and 10 per cent. on the quarter share capital, so soon as the 6 per cent. guarantee of annual interest thereon should expire; the York and North Midland Company to have power, on giving six months' notice at any time after five years from the commencement of the lease, to pay off the whole capital of the Company at the rate of £112 10s. for every original share of £50, £56 5s. for every half share of £25, and £28 2s. 6d.

* *Herapath's Journal*, 1845, p. 314.

§ *Ibid.*, p. 463.

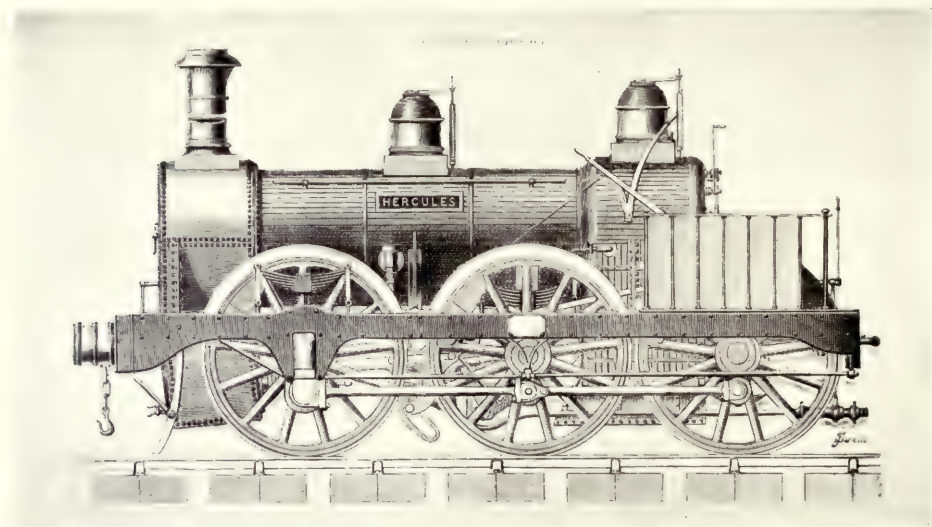
† *Ibid.*, p. 463.

|| *Ibid.*, p. 380.

‡ *Ibid.*, p. 308.

for every quarter share of £12 10s. The lease, it was suggested, should commence on the 1st July, 1845. The offer thus formulated was there and then accepted on behalf of the York and North Midland Company by their secretary, Mr. Baker, who was present at the meeting.*

The Leeds and Thirsk scheme, while in its embryonic stage, had helped to defeat a project to which Mr. Hudson had given his adhesion—the Harrogate, Knaresborough and Bolton Percy Railway. So early as the 22nd of February, 1844, a resolution had been carried in Knaresborough against the promoters of this railway to



From "The Engineer," Jan. 16th, 1880, p. 45.

THE "HERCULES" ENGINE (HULL AND SELBY RAILWAY).

the effect that, in the opinion of the meeting, the proposed railway from Leeds to the north by way of Harrogate, Knaresborough, Ripley and Ripon, for which a survey was then being made, would be of far greater utility to the public generally and to the interests of Knaresborough, Harrogate and adjoining places in particular than a railway from Bolton Percy to Starbeck,† and the Harrogate and Knaresborough Bill was partly opposed on the ground that the construction of such a railway would prevent a better line from being made from Leeds to Thirsk.‡ The Harrogate and Bolton Percy Company having been dissolved after the loss of their Bill in 1844, the York and North Midland Company projected a branch line of their own

* *Heraopath's Journal*, 1845, p. 708. † *Ibid.*, 1844, p. 216. ‡ *Railway Times*, 1844, p. 945.

from Church Fenton to Harrogate, which was intended to afford a more ready communication to the south and south-east than would be given by the Leeds and Thirsk line. The Great North of England Company also came forward with their Harrogate and Ripon junction scheme. Some negotiations took place between the Provisional Committee of the Leeds and Thirsk Company and the directors of the Great North of England Company with a view to arriving at an amicable arrangement, but the former were no more prepared to abandon the northern portion of their line and restrict their enterprise to a line between Leeds and Harrogate than the latter were ready to join in the furtherance of a rival scheme by taking equal shares in the Leeds and Thirsk Company.* Being unable to come to terms with the promoters of the Leeds and Thirsk scheme, the Great North of England Company ordered surveys to be made for an extension of their proposed Harrogate and Knaresborough line to Leeds by way of Spofforth, Rigton, Bardsey, etc., and, by a resolution passed at the half-yearly meeting held on the 11th February, gave a general undertaking that the line, if sanctioned by Parliament, should be extended in the manner suggested to Leeds.† Two other proposals were then made to the Leeds and Thirsk Company involving a partial or entire abandonment of their line, but the Leeds Board declined to entertain them.‡ The two Bills went before Parliament and had reached the Committee stage when, on the 27th May, 1845, it was announced that the promoters of the Harrogate and Ripon Junction scheme had decided to retire from the contest, a step which the chairman of the Committee could scarcely believe possible after so much evidence had been adduced.§ But a sensational event had happened. George Hudson had taken a lease of the Great North of England Railway on behalf of the Newcastle and Darlington Junction, Midland, and York and North Midland Railway Companies and ordered the withdrawal of the measure.|| For some months it had been apparent that the Great North of England and York and North Midland Boards were divided on a question of policy. So far from wishing to stop the progress of the London and York line, the directors of the Great North of England Company were prepared to welcome its arrival at York, anticipating increased prosperity from the junction of the two lines. "The York and North Midland Company," said Mr. G. H. Wilkinson, the chairman of the Great North of England Company, "had interests distinct from their own; these, as it fortunately happened, being identified with the

* *London Morning Chronicle*, 3rd February, 1845.

† *Herapath's Journal*, 1845, p. 263. ‡ *Ibid.*, pp. 635-636. § *Ibid.*, p. 842. || *Ibid.*, p. 992.

policy which was the best one for the public, viz., the carrying forward of the direct line between the Metropolis and Scotland.”* This was, of course, rank treason in the eyes of George Hudson, who determined at all costs to get hold of the Great North of England line, so that he might be in a position to say in effect to the London and York party, “you can no longer get to York to an independent Company and therefore you may as well stop at Lincoln.”

The Great North of England Company, who already appear to have had communications from the London and York Company on the subject of a lease,† occupied a most favourable vantage-ground for their negotiations with Mr. Hudson, and on the 27th May, 1845, the terms of a provisional agreement were arranged with him. The leasing Companies were to guarantee 10 per cent. on the £100 and £40 shares from the 1st July, 1845, 10 per cent. on the £30 shares from the 1st July, 1847, and 10 per cent. on certain £15 shares, which it was proposed to issue, from the 1st July, 1849. At any time previous to the 1st of July, 1850, they would be at liberty to purchase the railway, but, on this date, the Great North of England Company could compel them to purchase it at the rate of £250 for every £100 share, £100 for every £40 share, £75 for every £30 share, and £37 10s. for every £15 share.‡ It was, as Mr. Hudson said, the hardest bargain he ever drove.§ That the traffic on the line, even under the most careful management, would not pay such a rental he was obliged to admit, but he gained that uninterrupted control which would enable him, by “working out the railway system to the greatest possible perfection,” to realise his conception of a “well-regulated monopoly,” and to deal effectively with any competing company.|| The Newcastle and Berwick Railway Bill, the preamble of which had been proved on the previous day, now passed triumphantly through the House of Commons. The promoters of the Atmospheric railway had failed to establish their case. George Stephenson’s laconic dictum, “it won’t do,” had been more than confirmed by the evidence of Robert Stephenson, George Bidder, Joseph Locke, Thomas Hawksley, Robert Nicholson and Thomas E. Harrison. But for the authority of engineers so pre-eminently practical as the Stephensons, the railway historian might have had to include among the various modes of conveyance tried at one time or another

* *Herapath’s Journal*, 1845, p. 276.

† N. Plews, *Yorkshireman*, 25th August, 1849.

‡ *Herapath’s Journal*, 1845, p. 1004.

§ *Ibid.*, 1082.

|| *Ibid.*, pp. 1081-1082. The effect of this arrangement on the price of the shares was very striking. In July, 1843, the shares of the Great North of England Company were at 37 discount; in January, 1844, at 14 discount; in July, 1844, they were at par; in January, 1845, they had risen to £38 premium, and in July, 1845, when the arrangement had been made, they rose to £144 premium.

in the north of England that which was effected by the pressure of the atmosphere upon a travelling piston in an exhausted tube. The Committee of the House of Lords, being of opinion that the advantages of the Atmospheric system had not been sufficiently demonstrated by actual experiment, decided to confine the case to the respective merits of the two lines considered as locomotive lines. Lord Howick's party, however, were not prepared to contend for the superiority of the Northumberland line over its rival viewed only as a locomotive line and, on the 28th of June, they formally withdrew their opposition to the Newcastle and Berwick project.*

On the 1st July, 1845, the York and North Midland Company took possession of the Hull and Selby Railway and the Newcastle and Darlington Company who, by virtue of a clause in the lease had the right of pre-emption, began working the Great North of England Railway. On the 7th the formal opening of the Scarborough line (42 $\frac{1}{4}$ miles) and the branch to Pickering (6 $\frac{1}{2}$ miles), which had been completed in the short space of a year at a cost of less than £6,000 per mile, was another triumph for George Hudson. Free tickets to Scarborough had been issued with a liberal hand from all parts of the Railway King's dominions, available from the 5th to the 9th of July inclusive, and the celebrations were on a regal scale, comprising, besides the railway trip to Scarborough, in which the "Hudson" and the "Lion," drawing a train of 35 carriages, took a conspicuous part, a public breakfast at York, a procession through the streets of that city, a luncheon at Scarborough and a dinner at York.† The Scarborough line crossed the Ouse much nearer to the city than had originally been intended, owing to the opposition of the inhabitants of Clifton, and as the Great North of England Company objected to the line crossing their coal-branch at right angles, it had to be taken into the main line of that Company near the point of divergence of the branch. This arrangement involved some inconvenience in working, the trains having to be drawn out of the station and hauled nearly half-a-mile along the Great North of England line by one engine and then drawn back to the junction and taken forward to Scarborough by another.‡ The principal engineering work on this line was the bridge over the Ouse, which had been built without the aid of a cofferdam in 14 weeks, the foundations of the centre pier being laid on cast iron piles driven into the bed of the river. The superstructure of the bridge consisted of two cast-iron girders, each 75 feet in span, surmounted by wrought iron balustrades, and the pier and abutments of masonry filled in with brickwork. A timber bridge, 400 feet long, with arches, 50 feet each in

* *Herapath's Journal*, 1845, p. 1091.

† *Ibid.*, p. 1123.

‡ *Ibid.*



IRON BRIDGE OVER THE OUSE, AT YORK, SCARBOROUGH BRANCH.

span, askew at an angle of 28 degrees, crossed the Derwent at Huttons Ambo station, and an embankment and brick viaduct of 5 semi-circular arches, 45 feet in height and 25 feet in span, carried the railway over the Washbeck Valley near Scarborough. The station at Scarborough, designed by Mr. G. T. Andrews of York, consisted of stone buildings in the Italian style, with colonnade in front and station shed with wrought iron and glazed roof 348 feet long and 88 feet wide.* Within a month of the opening of the line a cheap trip was announced for the 5th August, 1845, from Newcastle to Scarborough and back in one day. "What next?" was the wondering comment of the *Gateshead Observer*.† One novelty of railway enterprise may be mentioned in connection with this line to Scarborough—the compilation of a list of lodgings, kept in the refreshment rooms at Scarborough, for the benefit of visitors.‡

The results of the Parliamentary session of 1845, so far as they affected the north-eastern part of England, may now be briefly summarised. Four new companies were incorporated with power to make 161 miles of railway, viz.:—

Name of Railway.	Description.	ACT.	Date of Royal Assent.	Length of	Capital intended to be raised in Shares and by Loan.
				Line. Miles.	
Leeds and Thirsk § ...	8 and 9 Vic. c.	163	21st July, 1845	46½	1,186,000
Middlesbrough and Redcar ||	" "	127	21st July, 1845	7¾	48,000
Newcastle and Berwick ¶	" "	163	31st July, 1845	95½	1,866,666
Wear Valley ** ...	" "	152	31st July, 1845	12	109,300
				161½	3,209,966

Powers were given for the purchase of the Brandling Junction, Whitby and Pickering, and Newcastle and North Shields Railways, for the construction of lines from Church Fenton to Harrogate (18½ miles), from Seamer

* *The Tourist's Companion on the York and Scarborough Railway*, 1846, pp. 10, 22, 30 and 31.

† *Gateshead Observer*, 2nd August, 1845.

‡ *The Tourist's Companion (ut supra)*, p. 31.

§ Directors appointed by the Act: Edward Baines, Christopher Beckett, Henry Bonbonous Beynon, William Williams Brown, Newman Cash, Joseph Dent, William Driffield, John Gott, The Hon. Edwin Lascelles, Charles Gascoigne Maclea, Henry Cowper Marshall, Thomas Mason, David William Nell, Charles Oxley, John Green Paley, William Smith, Thomas Starkey, Joshua Wordsworth, William Whincup, John Wormald. First chairman: Henry Cowper Marshall.

|| Directors appointed by the Act: John Castell Hopkins, Thomas Meynell, Edward Oxley, Henry Pease, Joseph Pease, Nathaniel Plews, Thomas Richardson, Henry Stobart, George Hutton Wilkinson. First chairman: George Hutton Wilkinson.

¶ Directors appointed by the Act: Robert Davies, George Hudson, Edward Oxley, Nathaniel Plews, James Richardson, Charles Tee, Nicholas Wood. First chairman: George Hudson.

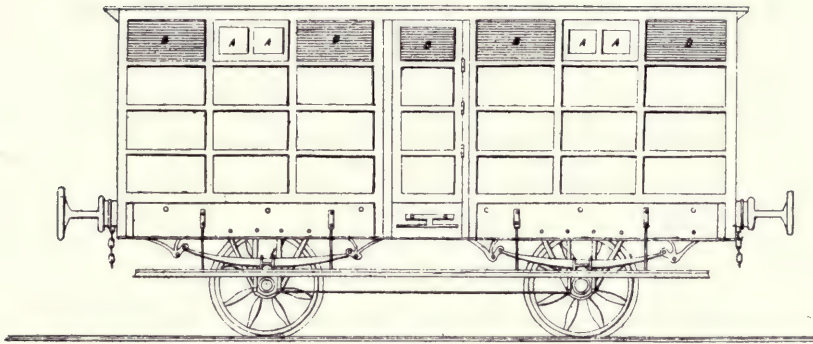
** Directors appointed by the Act: John Dolphin, John Castell Hopkins, Thomas Meynell, Henry Pease, Joseph Pease, Thomas Richardson, Henry Stobart, George Hutton Wilkinson. First chairman: George Hutton Wilkinson.

to Bridlington ($19\frac{3}{4}$ miles), from Hull to Bridlington (31 miles), from Cooper House near Dalton to Richmond ($9\frac{3}{4}$ miles), from Washington to Pelaw (5 miles), from the Manors to the Quayside, Newcastle ($\frac{1}{2}$ mile), for extensions to Monkwearmouth Bridge ($\frac{3}{4}$ mile) and Tynemouth (1 mile), connections between the Great North of England, Clarence and Hartlepool Junction and Newcastle and Darlington Junction Railways ($\frac{1}{2}$ mile), and alterations of the Whitby and Pickering Railway. Altogether 247 miles of railway were authorised to be made at an estimated cost of nearly three millions and a half.

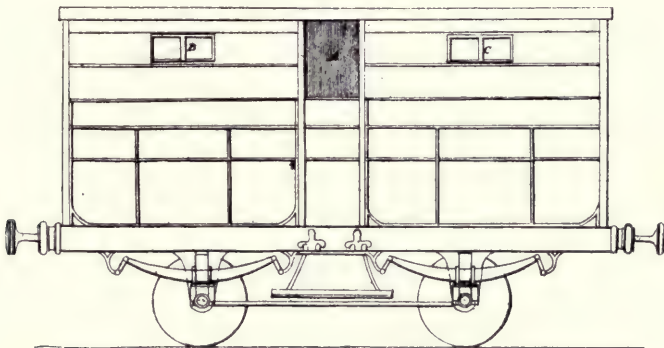
A factor in the evolution of the great railway system of the North of England was the political connection of Mr. Hudson with Sunderland. Only a few weeks after tilting so hotly with Mr. Hudson in the cause of the Northumberland Railway, Lord Howick had been summoned to the Upper House as Earl Grey and by the irony of fate, it was Mr. Hudson who won the seat at Sunderland rendered vacant by his lordship's elevation to the peerage. The election gave an opportunity to Mr. Allport to establish another railway record. Immediately after the closing of the poll, on the 14th August, 1845, he left Monkwearmouth by special train with a report of the proceedings for the *Times* newspaper and, notwithstanding a detention of nearly an hour on the Birmingham line, accomplished the distance of 303 miles (deducting stoppages) in seven hours and a half. On the arrival of the train in London, this report was at once set up in type and printed and, shortly before 3 o'clock in the morning, Mr. Allport left London to return to Sunderland with several hundred copies of the *Times*, which were actually distributed in the streets of the Wearside borough before the official declaration of the poll at 11 o'clock.* The quickest run made during the course of the journey was probably that of the "Richmond," a new engine built by Messrs. R. & W. Hawthorn, which took the "special" from Darlington to York in 52 minutes or at an average speed of 51 miles an hour.

The railway mania was now at its height and the number of railway projects affecting the north-eastern, as well as other parts of England, was legion. Two of these schemes, promoted and abetted by the Manchester and Leeds Company, threatened to invade the district of the York and North Midland Company, viz., (1) the Leeds and York Railway, which, starting from Wellington Street, Leeds, proceeded past Seacroft and Thorner to Clifford Moor and, crossing the Wharfe near Thorparch, ran by way of Walton, Syningthwaite, Bilton, Hutton Wandesley, Rufforth and Acomb

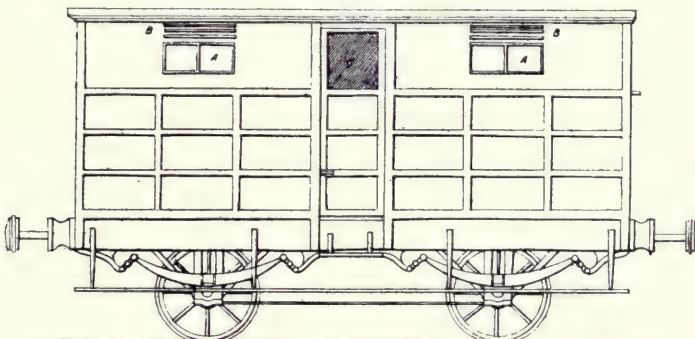
* *Herapath's Journal*, 1845, p. 1431.



NEWCASTLE AND DARLINGTON JUNCTION RAILWAY.



YORK AND NORTH MIDLAND RAILWAY.



GREAT NORTH OF ENGLAND RAILWAY.

THIRD-CLASS CARRIAGES USED ON THE MAIN LINE IN 1845.
(TO SEAT 40 PASSENGERS EACH.)

to York, shortening the distance between Leeds and York by $6\frac{1}{2}$ miles, and (2) the York, Hull and East and West Yorkshire Junction Railway which, uniting with the proposed Leeds and York and London and York Railways at York, passed over ground already surveyed for the purpose of railway extension by the York and North Midland Company—by Pocklington, Market Weighton, and Beverley to Hull, throwing out branches to Selby, Great Driffield and Hornsea. The Leeds and York scheme George Hudson professed to regard as “a mere bubble, a perfect absurdity, not worth notice,”* but, in conjunction with the York and Hull scheme, it formed a competing line of communication which, in the hands of the Manchester and Leeds Company, menaced very seriously the traffic of the York and North Midland and Hull and Selby railways. At the first rumour of competition, the York and North Midland Company began running two express trains a day between York and Leeds, and increased the travelling facilities between Hull and London and Hull and Newcastle.† They, also, announced their intention of making similar lines and branches of their own.

The Manchester and Leeds Company were at this time harassed by competing schemes in their own districts and disposed to adopt a more conciliatory policy. A suggestion which appears to have come from Robert Stephenson and John Hawkshaw‡ that the chairmen of the two Companies should meet and consider the possibility of arranging the differences between them led to important results. The meeting took place on the 19th September, and prepared the way for negotiations which, a month later, terminated in an agreement between the two Companies. The gist of the agreement was that the Manchester and Leeds Company, who had taken shares to the amount of £125,000 in the Leeds and York Company should withdraw their support from the two competing schemes on being admitted as joint lessees of the Hull and Selby Railway. All traffic between Hull and Manchester, it was arranged, should be sent, as far as possible, over the respective lines of the two Companies, and the traffic between Goole and Manchester over the Wakefield, Pontefract and Goole Railway. A clause in the agreement secured the making of a line from Selby to Goole by the York and North Midland Company without opposition from the Manchester and Leeds Company.§ The withdrawal of the Manchester and Leeds Company was a blow to the Leeds and York party which they bitterly resented, though the secession was accompanied by a reasonable offer of compensa-

* *Herapath's Journal*, 1845, p. 1082.

† *Ibid.*

‡ *Ibid.*, p. 2279.

§ *Third Report on York and North Midland Railway*, 31st October, 1849, p. 6.

tion.* Another scheme which met with the uncompromising opposition of Mr. Hudson was the Hull and Barnsley Junction Railway, projected in August, 1845, for the purpose of connecting the Manchester and Sheffield with the Hull and Selby Railway. Running from Barnsley to Howden, it would have competed with the main line of the York and North Midland Railway, and abstracted traffic from ten miles of the Hull and Selby Railway. The great object which Mr. Hudson had in view in taking a lease of the Hull and Selby Railway on terms so advantageous to the proprietors of that line was to secure immunity from competition, and he was indignant when he found that the promoters of the new scheme were the parties who had been chiefly instrumental in arranging the terms of the lease.† To a deputation from the Provisional Committee who waited upon him he stated that the York and North Midland were prepared to carry goods for nothing for ten years rather than lose the traffic.‡

To some of the schemes of this period Mr. Hudson gave his powerful support. The Isle of Axholme, Gainsborough and Goole Railway was one of these. To the capital of the Company the York and North Midland Company agreed to subscribe £100,000 in order that the line might be extended from Goole to Selby. By the terms of the agreement the whole line from Gainsborough to Selby, when completed, was to pass into the hands of the York and North Midland Company under a guarantee of $4\frac{1}{2}$ per cent.§ This extension would help the York and North Midland Company forward to Lincoln, and enable them in the prospective competition with the London and York Company to secure a fair share of the traffic between Lincoln and York. Mr. Hudson also subscribed, on behalf of the York and North Midland Company, for shares to the amount of £40,000 in the Malton and Driffield Junction Company,|| the line which it was intended to make forming a desirable extension of a proposed branch of the Great North of England Company from Thirsk to Malton. A scheme embracing the whole district between Thirsk and Driffield, which had previously been advocated under the title of the "Hull, Malton and Northern Union Railway," was once more brought forward in opposition to what the promoters of it called "the pirated fragment" of their own line, but without success.¶ The "East and West Yorkshire Junction Railway" connecting Knaresborough and York, was another local line

* *Herapath's Journal*, 1846, pp. 4-6.

† *Ibid.*, p. 131.

‡ MacTurk's *History of the Hull Railways*, 1879, p. 93.

§ *Herapath's Journal*, 1845, p. 2310, and 1846, p. 131.

|| *Ibid.*, 1846, p. 131.

¶ Circular dated 12th January, 1846.

projected with the concurrence of George Hudson, who readily concluded an agreement with the promoters of the scheme for a junction with the Great North of England Railway and the use of the station at York.* Previous to the leasing of this line, the Great North of England Company had arranged to take 5,000 shares (£250,000) in the York and Carlisle Junction Railway Company.† The object of this Company was to connect the Great North of England Railway, in the first place, and the Stockton and Darlington in the second, with the Lancaster and Carlisle Railway at two points—Tebay and Clifton, near Penrith. The line of railway, following generally a north-westerly direction, ran from Northallerton by way of Catterick Bridge, Gilling and Ravensworth to the valley of the Greta—being joined at Scargill by a branch from Bishop Auckland—by way of Bowes and Brough, within a short distance of Kirkby Stephen and, throwing out a branch to Tebay, proceeded along the valley of the Eden by way of Appleby and Temple Sowerby to Clifton.‡

The York and Carlisle Railway was soon the centre of a whole system of projects. On the north were the Northumberland and Lancashire Union Railway (a combination of the Newcastle and Durham and Lancashire Junction, and the Manchester, Liverpool and Great North of England Union schemes) running from Gateshead along the Team Valley by way of Durham to Bishop Auckland, and thence in competition with the York and Carlisle Railway by Barnard Castle, Startforth, Bowes, Kirkby Stephen, and Tebay,§ and the Sunderland, Durham and Auckland Union Railway, an extension of the Durham and Sunderland line, from Croxdale to Bishop Auckland; on the south were the Liverpool, Manchester and Newcastle Junction Railway—a line from Preston by way of Clitheroe, Settle, Hawes, and Askrigg to Richmond, which had the active support of Mr. Hudson;|| the Lancashire and North Yorkshire Railway, commencing at Elslack on the Leeds and Bradford Railway between Skipton and Colne, and proceeding by way of Colne, Gargrave, Kettlewell and Middleham to Scorton.¶ A formidable rival of the York and Carlisle scheme was the Yorkshire and Glasgow Union Railway, running from Thirsk by way of Bedale, Newton, Leyburn, Askrigg, Hawes and the vale of Mallerstang to Kirkby Stephen and thence by the valley of the Eden to Clifton.** From this railway an

* *Herapath's Journal*, 1845, p. 1913, and 1846, p. 1419.

† *Ibid.*, 1846, p. 1044.

‡ *Ibid.*, 1846, p. 563.

§ *Ibid.*, 1845, pp. 706, 982, 1747.

|| *Ibid.*, pp. 934, 1207.

¶ *Ibid.*, p. 1031.

** *Ibid.*, p. 1024.

auxiliary line, the Great North of England and Yorkshire and Glasgow Union Junction Railway was projected, to run from Wath through Dishforth, Boroughbridge and Aldborough to Alne* where it would meet another railway, the North and East Riding Junction Railway, running from Alne, in an easterly direction, by way of Easingwold, Stillington, Huby, and Sutton on the Forest to Strensall, and thence by Stamford Bridge to Pocklington, effecting a junction there with the proposed York and Hull Railway.†

Besides these schemes already mentioned, there were numerous others, some of them wildly impracticable, which covered the surface of the northern counties in every direction with a complicated network of imaginary lines. The mere enumeration of these lines will show the extraordinary extent to which the North of England was affected by the railway mania. First in point of order come the trunk lines and extensions of trunk lines: the "Newcastle and Leeds Direct Railway" from the Northumberland and Lancashire Union Railway at Bishop Auckland *viâ* Richmond, Bedale, Masham, Ripon and Ripley to the Leeds and Thirsk Railway at Wath; the "Midland and Thirsk Junction Railway" from Wakefield through Leeds, Knaresborough and Boroughbridge to Thirsk; the "London and Edinburgh, Darlington and Hawick Railway" from Darlington by way of Bishop Auckland, Satley, Ebchester, and Newbrough to Hawick, the "Newcastle-upon-Tyne and Hawick Railway" from Hexham, up the valleys of the North Tyne and Rede to Hawick; the "Newcastle-upon-Tyne, Edinburgh and Direct Glasgow Junction Railway," from Newcastle side by side with the Newcastle and Carlisle Railway to Denton Burn, thence by way of Newbiggen House, Belsay, Capheaton, Woodburn, the Rede Valley and Carter Fell to Hawick, the "Direct Newcastle-upon-Tyne and Durham and Great North of England Extension Railway" from Shincliffe to Gateshead along the Team Valley; the "Lancaster and Newcastle-upon-Tyne Direct Railway" from Lancaster by the valley of the Lune, Kirkby Lonsdale, Sedbergh, and Kirkby Stephen to Stanhope; the "Lancaster and York Railway" from Lancaster by way of Settle, Skipton and Knaresborough to York; the "York and Kenyon Junction," afterwards the "York and East Lancashire Junction Railway" from York by Wetherby, Otley, Keighley, Colne, Burnley, Haslingden, Tottington and Tyldesley to the Kenyon Junction of the Liverpool and Manchester Railway; and the most remarkable of all these schemes—the "Newcastle and London Coal Railway"—an independent line which was

* *Herapath's Journal*, p. 1908.

† *Ibid.*, p. 1898.

to cost five millions and "be devoted exclusively to the conveyance of coals and goods at a moderate and regular speed." Then follow a number of local lines—the "East and West Durham, Northumberland and Scottish Junction Railway" from Durham to Hexham by way of Lanchester, Knitsley, Allansford and Whittonstall with branches to the Ludworth Branch of the Hartlepool Railway and the Hedley Hill coal-field; the "Newcastle, Shotley and Weardale Junction Railway," from Blaydon to Shotley Bridge; the "Wear Dock Railway," from Durham to Sunderland with branches to the Newcastle and Darlington Railway at Penshaw and the Hartlepool Railway at Pespool; the "Darlington and Hartlepool Railway" from Darlington by Barmston, Stainton, Bishopton, Redmarshall, and Carlton to the Clarence Railway near Norton Junction; the "Lancashire, Weardale and Hartlepool Union Railway," from Bishop Auckland to Thrislington; the "Barnard Castle and Darlington Junction Railway" from Barnard Castle to the Hagger Leases Branch of the Stockton and Darlington Railway; the "Stockton, Northallerton and Leeds Railway," from Stockton to Northallerton, in opposition to the Leeds and Thirsk "north eastern extension" scheme; the "Whitby, Pickering, Thirsk and Great North of England Railway" from Thirsk to Pickering; the "Scarborough, Whitby, Stockton-on-Tees and Newcastle and North Junction Railway," from Scarborough to Whitby and thence by Guisbrough to Stockton-on-Tees, etc.

By their connection with some of these schemes certain existing lines became, prospectively, of course, sections of important trunk lines. One of these was the Durham and Sunderland Railway which, by two short stages, one from Shincliffe to Houghall on the 17th February, 1842, and the other from Houghall to Blade's Wood near Croxdale on the 20th May, 1845, had advanced to a point near the Brandon Coal-field. The extension of the line from Houghall to Bishop Auckland was one of the projects of the Company by which they proposed to divert traffic from the Tees to the Wear and to complete a direct line of communication between Liverpool and Sunderland. They were also going to Parliament for powers to make a new main line adapted to the use of locomotive engines, from Sunderland Moor through Silksworth, Herrington, and Houghton-le-Spring to a point near the Letch engine and to construct a short branch between their own line and that of the Newcastle and Darlington Company at Sherburn Station by which the distance between London and Sunderland would be shortened no less than six miles. Realising the danger of leaving an independent company with important shipping-places in a position to make undesirable alliances, George

Hudson, early in October, 1845, opened negotiations with the directors of the Durham and Sunderland Company for the purchase of their line and works. His prescience was justified, for hardly had the preliminary steps been taken, when the Sunderland Board received a communication from the provisional directors of the Lancashire and North Yorkshire Company which had the effect of impeding the negotiations.* Ultimately terms were arranged, Mr. Hudson agreeing to give £31 10s. for every £50 share and to take over the debts and other liabilities of the Durham and Sunderland Company. It was an excellent bargain for the Durham and Sunderland



J. H. Leonard, del.

WEARMOUTH DOCK.

Company, whose shares had been, in 1841, as low in the market as £15, and their embarrassments so great that unless the landowners had consented to reduce the wayleave rents and the coal-owners agreed to accept an increase in the dues on coals carried coastwise the works would have come to a standstill.† About the same time Mr. Hudson effected an arrangement with the Pontop and South Shields Company for the transfer of their line and works (exclusive of the collieries which were to be sold) to the Newcastle and Darlington Junction Company.‡ He took up the old project for the formation of a dock on Jarrow Slake, purchased the Wearmouth Dock, which had

* *Herapath's Journal*, 1846, p. 994.

† *Ibid.*, 1845, pp. 2424 and 2464.

‡ *Tyne Mercury*, 22nd October, 1845.

never paid a dividend since the opening, for £85,000,* and subscribed, on behalf of the Newcastle and Darlington Company, for shares to the amount of £75,000 in the newly-formed Sunderland Dock Company.† In pursuance of his plan to get all the shipping places on the north-east coast under one control, he made a provisional agreement with the Hartlepool Dock and Railway Company for the lease and purchase of their docks and railway, undertaking to carry out a similar agreement which the Hartlepool Company had made with the Great North of England, Clarence and Hartlepool Junction Railway, the terms in the one case being 10 per cent. on the capital with power to purchase at the rate of £220 for every £100 share and, in the other, 3 per cent. until July, 1848, and then 5 per cent. with power to purchase at par.‡ Finally, he proposed that the Newcastle and Darlington Junction Company should alone be the lessees and purchasers of the Great North of England Railway.

This bold scheme of consolidation was accompanied by a large scheme of extension which comprised branches from Chevington to Warkworth Harbour (5 miles), from the Blyth Branch to Bedlington ($2\frac{3}{4}$ miles), from Penshaw to Sunderland (7 miles), from the Durham and Sunderland Railway near Houghall to the Bishop Auckland and Weardale Railway, at Bishop Auckland ($12\frac{1}{2}$ miles), from Northallerton to Bedale (7 miles), from Thirsk to Malton ($23\frac{1}{4}$ miles), and from that line to Helmsley ($5\frac{3}{4}$ miles), Sessay ($2\frac{3}{4}$ miles), and New Malton ($\frac{3}{4}$ mile), from Pilmoor to Boroughbridge ($5\frac{3}{4}$ miles), from York to Beverley (31 miles), from Selby to Market Weighton (16 miles), from Arram to Hornsea ($10\frac{1}{2}$ miles), from Market Weighton to Driffield (9 miles), from Copmanthorpe to Tadcaster and Leeds (17 miles), from Grosmont to Castleton ($10\frac{1}{2}$ miles) and, in addition, a dock at Jarrow Slake. All these branches and works with the exception of the Bedlington Branch of the Newcastle and Berwick Company, the Driffield Branch of the York and North Midland Company, and the Jarrow Dock of the Newcastle and Darlington Junction Company were duly authorised in the session of 1846 by Parliament, who also sanctioned the lease and purchase of the Hull and Selby Railway by the York and North Midland and Manchester and Leeds Companies, the purchase of the Wearmouth Dock and the Durham and Sunderland and Pontop and South Shields Railways by the Newcastle and Darlington Junction Company, and the lease and purchase by that Company of the Great North of England Railway, the name of the Company

* *Herapath's Journal*, 1845, p. 2609.

† *Ibid.*, 1846, p. 133.

‡ *Ibid.*, 1845, p. 232.

being changed under the Act (9 and 10 Vic. c. 242, 27th July, 1846), to the York and Newcastle Railway. A few weeks after, several of the lines authorised in the preceding session were formally opened—the Richmond Branch on the 10th September, the Filey Branch (Seamer to Filey), on the 5th October, and the Hull and Bridlington Branch (with much ceremony by a train of 50 carriages drawn by three engines—the “Ariel,” the “Antelope,” and the “Hudson”) on the 6th October. On the 12th October, the directors of the York and Newcastle Company formally took possession of the Hartlepool Dock and Railway and also of the Great North of England, Clarence, and Hartlepool Junction Railway (the last part of which, the short loop line at Thinford, had just been completed), a special train travelling over the two lines from Ferryhill to Hartlepool.

At this point let us retrace our steps a short distance and follow the progress of the other lines which had not come under the control of Mr. Hudson.

The most important of these was the Newcastle and Carlisle Railway which served the whole country westward of Newcastle. Until 1844, the line between Stocksfield and Hexham and between Rosehill and Milton was a single track but, in that year, the Directors doubled these portions of the railway in preparation for the increase of traffic anticipated from the opening of the Newcastle and Darlington Junction Railway, at the same time enlarging the Farnley Tunnel near Corbridge—a work accomplished without stopping the running of the trains except for a few days subsequent to the 28th of December, 1844, when, a portion of the old roof having been damaged, the superincumbent loose sand slid down and blocked the passage.* In 1845, having come to an agreement with the York and Newcastle and Newcastle and Berwick Companies for the erection of a joint central station at Newcastle on the south side of Neville Street, they proceeded to extend their line to the Forth Banks, carrying the railway on a picturesque viaduct of 44 arches, which was formally opened on the 6th November, 1846. It was the intention of the Newcastle and Carlisle Company in 1845, to occupy the valley both of the North and the South Tyne, but, in 1846, only one line was sanctioned by Parliament—that from Haltwhistle to Alston and Nenthead.

The Stockton and Darlington Company, to whose line we turn next, had from the earliest period of their existence contemplated the extension of

* *Tyne Mercury*, 1st January and 22nd October, 1845.

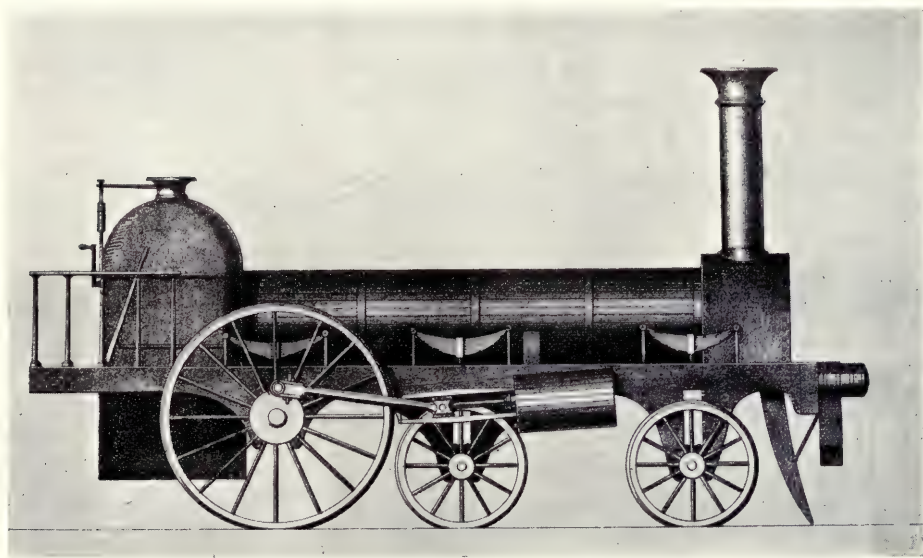
their railway to the limestone district of Weardale. Beyond these limits it is doubtful if they dreamed of going. The competition of the West Durham Railway Company, however, forced them northward to Crook, a point which they reached on the 8th November, 1843. On this date, the Bishop Auckland and Weardale Railway ($8\frac{1}{4}$ miles) leased by the Stockton and Darlington Company at 6 per cent., was opened throughout, being worked partly by gravity—at the upper end where the gradients averaged 1 in 44—and partly by locomotive power. From the termination of this railway at Crook the Derwent Iron Company, who, it will be remembered, had purchased the western portion of the old Stanhope and Tyne Railway, projected in 1843 a line to Meeting Slacks or Waskerley Park, for the purpose of getting an outlet to the south for their Stanhope lime. Having obtained a right of way from the landowners they submitted their plan to the Stockton and Darlington Board, who agreed to make and work the line for them on certain terms. A year later they leased, and subsequently sold, to the Stockton and Darlington Company, the old line from Stanhope to Carr House with the quarries at Stanhope and the short connecting-line between Harelaw and Tanfield Moor, engaging to become responsible for a large amount of traffic annually. The Stanhope and Carrhouse line and its appurtenances passed into the possession of the Stockton and Darlington Company on the 1st January, 1845, and, with the Weardale Extension Railway (10 miles) opened for traffic on the 16th May, 1845, formed the Wear and Derwent Junction Railway, the most curious railway, perhaps, in the country, comprising, as it did, not only the steep gradients of the earlier line, but those of the later one which, on the Sunnyside Incline, varied from 1 in 32 to 1 in 13.*

An independent Company had been formed to make a line of railway up the Wear Valley to Frosterley and the Stockton and Darlington Company were pledged to take a lease of the line when completed for a term of 21 years at a rental equal to 5 per cent. on the capital invested.† It was the intention of the Wear Valley Company in 1845 to carry their line from Frosterley by Alston and Milton to Carlisle, but the commercial depression of 1846 stopped the progress of the scheme. To another independent company, incorporated for the purpose of making a line from Middlesbrough to Redcar, they had guaranteed, jointly with the Great North of England Company, a dividend of 5 per cent. At the opening of this line on the

* *Report on Railways*, 1850, p. 83.

† *Annual Report*, August, 1845.

4th June, 1846, "Locomotion," once more an object of public interest, with a carriage and two trucks attached to it, led the way to Redcar, followed by the engine "A" of the Great North of England Company which had played so notable a part in the experiments of the Gauge Commissioners six months before.* In 1846 were arranged the details of a great scheme of consolidation, the proposal being that the Wear Valley Company should purchase the Bishop Auckland and Weardale Railway, the Wear and



From 'Observations on the Gauge Commissioners' Report,' 1846.

THE "A" ENGINE.

Derwent Railway, the Weardale Extension Railway, and the Shildon Tunnel, and then lease the whole of the lines so united to the Stockton and Darlington Company.

From the Stockton and Darlington we pass by a natural transition to the Clarence Railway to record the struggle of an unfortunate Company with adverse circumstances. Early in 1842 the principal feeder of the railway—the West Durham line—was closed for some weeks, the proprietors of it being unable to meet their current expenses. In September, 1842, certain creditors of the Clarence Railway Company, by a legal process

* *Railway Record*, quoted in *Mechanics Magazine*, 1846, pp. 20 and 21.

peculiar to the County of Durham at this period, called a writ of pone,* were about to put themselves in a position to seize upon the railway when, on the 26th of the month, the Exchequer Loan Commissioners, to whom the Company were largely indebted, entered and took possession of the railway. On the 4th October, Messrs. Shuttleworth and Sons, of London, advertised the railway for sale by public auction. Measures were at once taken by the more energetic shareholders to arrest the sale and recover possession of the railway. The amount due to the Commissioners was £149,394 and to various bondholders and other creditors £124,251, total £273,645. A plan for the conversion of the whole of this debt into capital was submitted and adopted at meetings held respectively in London and Stockton on the 12th and 15th of October and, by the immediate issue of 6 per cent. preference shares, the amount which it was necessary to pay by the 1st of November, to prevent the sale of the railway, viz., £79,150, was raised, and a financial disaster averted.†

The Company were at this time in fierce conflict with the Great North of England, Clarence and Hartlepool Junction Railway Company who had renewed their attempts to gain access to the West Durham Coal-field. Acts of hostility had begun at the Sherburn Branch of the Clarence Railway near Thrislington, which the Junction Company had no power to cross. If defeated at this point, the Clarence Company intended to fall back upon a strong position in the rear. Foreseeing the struggle, they had retained possession of a small piece of land at Hagg's Beck, acquired under the powers of their Act for the purposes of the Byers Green Branch, and had constructed across it in 1840, after the expiration of the powers of the Act, a short junction line, 97 yards in length, between the actual termination of the branch and the West Durham Railway.‡ As the line thus formed was not subject to the conditions imposed by Parliament, the Clarence Company could levy what tolls they pleased upon the coals passing over it and in that way raise a barrier against traffic consigned to Hartlepool by way of the Junction Railway. The dispute was carried to the Law Courts and decided in favour of the Clarence Railway Company. The Junction Company then applied

* Virtually abolished on the 8th June, 1853, by a decision of Mr. Justice Cresswell and Baron Martin, sitting together at chambers as Justices of the Court of Pleas at Durham.

† *Gateshead Observer*, 22nd October, 1842; *Herapath's Journal*, 1844, p. 984.

‡ *Special Report from the Committee on the Clarence Railway Bill*, 5th May, 1843. The position of this line is shewn by two large stones which were set up in 1841, the eastern one inscribed '1836. The Parliamentary terminus of the Byers Green Branch of the Clarence Railway,' and the western one '1836. The boundary of the property of the Clarence Railway Company.'

for and obtained the necessary Parliamentary powers to cross the Sherburn branch by a bridge and also to make a shorter and less expensive line from that point to the Byers Green Branch. As the Clarence Company were at the same time seeking power to reorganise their financial affairs and lease their line to the Stockton and Hartlepool Railway Company, the Junction Company raised the question of "Greaves' Land" and secured the insertion of clauses in the Bill making this strip of land subject to the provisions under which the remainder of the line was constructed. The Junction Company let the contract for the bridge in December, 1843, but the Clarence Company refused to allow them to make use of the land adjoining the Sherburn branch for the erection of the necessary scaffolding, etc., placing watchers there, day and night, with instructions to resist any trespass on their property, and even building high walls at the point where the bridge was intended to cross.* These obstructive tactics, leading to renewed litigation, still further delayed the completion of the works. In these proceedings they received the support of the Stockton and Hartlepool Railway Company whose interests were so vitally connected with their own. Soon after the Parliamentary incorporation of this Company in 1842, a number of the leading shareholders in it had revived the original scheme for a dock at the termination of their railway and, on the 23rd May, 1844, under the title of the Hartlepool West Harbour and Dock Company, they obtained an Act (7 Vict. cap. 28), authorising the construction of a dock and harbour at New Stranton; the capital which they were empowered to raise for the purpose was £52,400 in shares and £17,000 by loans. The Stockton and Hartlepool Railway was an extension of the Clarence Railway, the dock an adjunct to both. The advantage of uniting the two railways under one management was obvious and, in August, 1844, an arrangement was concluded whereby the Clarence Railway Company leased their line to the Stockton and Hartlepool Company for twenty-one years from the 2nd September, 1844, at a percentage of the gross receipts on a fluctuating scale.† Soon afterwards the prospects of the Clarence Company began to look brighter. The gross receipts which in 1842, the year of the seizure, were £26,736 amounted in 1845 to £42,449 and, for the first time in their history, the Company were able to pay a small dividend on the original shares at the rate of $1\frac{1}{2}$ per cent. The works of the new dock, begun on the 27th January, 1845, were progressing rapidly and

* *Herapath's Journal*, 6th December, 1844.

† *Ibid.*, 28th August, 1844.

negotiations of an important character had already taken place between the Leeds and Thirsk Company and the two associated Companies.

The Leeds and Thirsk Company, who now come prominently to the front, had obtained powers under their Act to make a railway from Leeds to Thirsk with branches to Harrogate and Knaresborough, etc., and also to purchase the River Ure Navigation. The original intention of the Company had been to carry the railway through to Stockton, Middlesbrough, and Hartlepool and, within a very short time of the cutting of the first sod of their line on the 20th October, 1845, they were ready with plans for a north-eastern extension, from Wath to Billingham, proposing, if terms could be arranged, to purchase the Stockton and Hartlepool Railway. In submitting this measure to Parliament the Leeds and Thirsk Company met with the most determined opposition from Mr. Hudson, who proposed to take their traffic from Thirsk to Thrislington and then by the two lines which he had just leased to Hartlepool, charging, not according to the actual distance travelled, but according to the distance of the shortest route by which they could get to Hartlepool.* During the progress of the Bill they agreed to give up a portion of the proposed line between Melmerby and Northallerton and use the Great North of England line between Thirsk and that point, restricting the extension to a line from Northallerton to Billingham (20½ miles) with three short connecting-lines (2 miles) and, thus curtailed, the measure passed, receiving the Royal Assent on the 16th July, 1846. They also obtained power to purchase the Stockton and Hartlepool Railway, to extend their Knaresborough Branch across the river Nidd into the town of Knaresborough (½ mile) and to make alterations in one of the branches connecting their railway with the Leeds and Bradford line.

The last of the independent lines, of which a brief account must be given, is the Blyth and Tyne Railway. In 1843 the only outlets for a large portion of the steam coal district of Northumberland were the small private harbours of Blyth and Seaton Sluice. At Blyth the depth of water was not more than 10 or 12 feet in neap tides and 12 or 14 feet in spring tides, so that only ships of small burden could come there, and even they had to take in a portion of their cargoes from keels at sea. As copper-bottomed ships would not enter the harbour the foreign trade was much restricted. The Bedlington Coal Company had just adopted a novel method of shipping their coals in the Tyne. Loaded chaldron waggons (40 in number) were conveyed by an iron

* *Gateshead Observer*, 13th March, 1847.

twin-screw steamer called the "Bedlington"—specially constructed for the purpose in 1842—from the staiths on the north side of the river Blyth near Mount Pleasant to Shields Harbour and there discharged into colliers by means of steam derricks with which the vessel was provided.* The difficulty of competing with collieries more favourably situated made the coal owners of the district very anxious to have access to the Tyne by railway. A line from Bedlington to Seghill was surveyed by Benjamin Thompson in 1843 for Mr. William Woods of Newcastle, who proposed to construct it as a private venture.† Another line was the subject of a report by Robert Nicholson, to Messrs. John Jobling and Partners, the lessees of Cowpen and Hartley Collieries. Mr. Jobling's scheme was to ship the coals from the five collieries of Cowpen, Bedlington, Netherton, Bedlington Glebe and Hartley at the Low Lights, North Shields.‡ The line proposed ran direct south from the Blyth to the Tyne, coinciding in part of its course with the Whitley waggonway. The Newcastle and North Shields Railway Company, who worked the passenger and goods traffic on the Seghill Railway from the 25th June, 1844, had in view the extension of this line to Blyth§ until they were merged in the Newcastle and Berwick Company. In July, 1845, Messrs. Jobling and Partners decided to construct a part of the proposed railway, and, by forming a junction with the Seaton Delaval Railway and arranging for the connection of this latter railway with the Seghill Railway, secure a provisional route to the Tyne.|| Let in August, 1845, the works of the "Blyth and Tyne Junction Railway," as it was called, were stated in October to be within four months of completion.¶

About the same time an important part of the original plan of the Newcastle and North Shields Railway Company was revived under the title of the "Northumberland Dock and Percy Branch Railway." The chairman of the Company formed to promote this scheme was George Hudson, who proposed to make Coble Dene the point of convergence of all the colliery lines of the district under the control of the Newcastle and Berwick Railway Company. An Act authorising the construction of the dock and branch railway was obtained on the 26th June, 1846, and a few months after, Mr. Hudson, joining forces with Mr. Jobling, who had already registered a new Company under

* *Newcastle Daily Chronicle*, 4th and 9th December, 1901. The "Bedlington" was sold in April, 1851, and afterwards employed as a ferry-boat across the Firth.

† B. Thompson's Journal, 30th July, 1843.

‡ *Ibid.*, 26th October, 1843.

§ *Tyne Mercury*, 2nd January, 1844.

|| Cowpen Papers, vol. 3, Watson Collection, Mining Institute.

¶ *Tyne Mercury*, 15th October, 1845. The line was not opened for passenger traffic until 3rd March, 1847.

the name of the "North Shields, Blyth and Berwick Junction Railway,"* deposited plans for the "Cramlington and Percy Main, Killingworth and other branches" and the "East Coast, Blyth and Seaton Sluice and other branches." As, however, the bills for these branches were afterwards suspended and then on account of difficulties with the landowners abandoned, the series of lines between the Blyth and the Tyne and the shipping places at Cowpen Quay, Seaton Sluice and Howdon remained in private hands.

Of the many new companies who applied for powers in 1845 to make lines in the North-Eastern territory four only obtained acts. Two, which belong to the York and North Midland group, are now incorporated with the North Eastern Railway Company, viz.:—

Name of Railway.	ACT.		Length of Line. Miles.	Capital intended to be raised in Shares and by Loans. £
	Description.	Date of Royal Assent.		
East and West Yorkshire Junction †	9 & 10 Vic. cap. 164	16th July, 1846	15½	266,600
Malton and Drifffield Junction ‡	„ „ 77	26th June, 1846	24	320,000
			39½	586,600

The two other Companies—connected incidentally with the North Eastern Railway—were the Liverpool, Manchester, and Newcastle-upon-Tyne Junction, and the Northern Counties Union Companies. Each was formed by the union of two distinct Companies. The lines which the Liverpool, Manchester and Newcastle-upon-Tyne were authorised to make were the main line of the Lancashire and North Yorkshire Company from Elslack to Scorton (47½ miles) and the Hawes Branch of the original Liverpool, Manchester and Newcastle Junction Company (9 miles). Those which the Northern Counties Union Company were empowered to make were the main line of the Yorkshire and Glasgow Union Company from Thirsk to Clifton (69 miles), and a portion of the York and Carlisle Railway between Bishop Auckland and Tebay (50½ miles), with the Wath branch (7 miles), and the Auckland branch (¾ mile). Total 127 miles. As, however, a portion of the Liverpool, Manchester and Newcastle-upon-Tyne Railway between Newton-le-Willows and Askrigg was almost identical in direction with part of the

* Cowpen Papers, vol. 3, Mining Institute.

† Directors appointed by the Act: William Ackroyd, William Drifffield, Joseph Dent, John Eteson, David Wm. Nell, John Green Paley, Henry Powell, John Wilson, William Whincup, Junr. First chairman: Joseph Dent.

‡ Directors appointed by the Act: William Allen, Edward Stillingfleet Cayley, M.P., William Charles Copperthwaite, John Henderson, John Hopkins, Henry Jackson, Lord Morpeth, Isaac Priestman, Robert Searle, John Slater, Thomas Teesdale, Thomas Walker. First chairman: Lord Morpeth.

Northern Counties Union line provision was made in the act that only one line should be made between these two points. The total capital which the two Companies were authorised to raise was £5,860,000.

The Axholme, Gainsborough, and York and North Midland Junction Company, of which George Hudson was chairman, lost their Bill in the House of Lords owing to a serious error in the levels of 7 feet,* but prepared to renew their application for the Bill in another session.

Hardly had the Leeds and Thirsk Company got power to extend their line to Hartlepool—the natural termination of their line—than they formed plans for the invasion of the very district in which George Hudson thought himself most secure from competition—the district between the Tees and the Tyne. Railway stocks were much depressed at this time, and it is doubtful if active measures would have been taken to promote the carrying out of these plans, but George Hudson divined the danger and, on the 27th July, 1846, the directors of the York and Newcastle Railway Company, in their half-yearly report, made known their intention of applying for Parliamentary powers to construct a line through the Team Valley from Gateshead to Durham,† which would have the effect of blocking up the only remaining approach to Newcastle from the south. In making this announcement, they forced the hand of the Leeds and Thirsk party who, without loss of time, brought forward the project of their Leeds, Durham and Newcastle extension. They proposed to make a line from Egglescliffe to Stillington to join the Clarence Railway and a line from Ferryhill by Durham to Gateshead, utilising the Clarence Railway between Stillington and Ferryhill.

Mr. Hudson then tried to purchase the Clarence Railway, offering at first £315,000, then £350,000, but without being able to come to terms.‡ On the 28th November, 1846, the Leeds and Thirsk Company made an offer of £450,000 for the Clarence Railway (exclusive of the working stock) which, representing, as it did, to the original shareholder a return of about £55 per share, after the payment of all liabilities, was immediately accepted. They also agreed to purchase the Stockton and Hartlepool Railway for £240,000.§ Any satisfaction which they may have felt at outbidding Mr. Hudson, must have been tempered by his remark that the traffic of the two concerns could be abstracted from them by the York and Newcastle Company whenever they thought fit to compete for it.|| Mr. Hudson was now pre-

* *Herapath's Journal*, 1846, p. 868.

† *Ibid.*, 1846, p. 960.

‡ *York and Newcastle Railway Minutes*, 5th November, 1846.

§ *Herapath's Journal*, 1847, pp. 51 and 52.

|| *Gateshead Observer*, 13th March, 1847.

paring to complete his great scheme of consolidation. The preliminary arrangements had been made for the amalgamation of the York and Newcastle and Newcastle and Berwick Railway Companies, when the question arose whether it would not be desirable to get control of the North British Railway. After some negotiations, Mr. Hudson offered to take a lease of that line at 8 per cent. on the share capital from the 1st July, 1847. To guard, however, against the contingency of another line between Newcastle and Edinburgh being sanctioned by Parliament, the lessees, it was stipulated, should have the option of terminating the lease at the end of every three years on giving one year's notice, but in that case the North British Company might claim the right of amalgamation with the two other Companies on equal terms.* Strange to say, these remarkably liberal terms were rejected by the directors of the North British Company.

On the 1st January, 1847, the York and Newcastle Company took possession of the Pontop and South Shields Railway, the Durham and Sunderland Railway and the Wearmouth Dock. The acquisition of these lines and dock was followed by the opening of a portion of the Newcastle and Berwick Railway between Heaton and Morpeth ($14\frac{1}{2}$ miles) on the 1st March, of a second portion of this railway between Tweedmouth and Clathill ($19\frac{3}{4}$ miles) on the 29th March, of the Tynemouth extension line (1 mile)—half of it a tunnel under North Shields—on the 31st March, and of the Boroughbridge Branch ($5\frac{3}{4}$ miles) on the 17th June.

On the 24th June the battle of the Team Valley was decided in favour of the York and Newcastle Company; the Leeds and Thirsk Company, though supported by the Town Councils of Newcastle, Gateshead and Durham, being beaten at all points. The ultimate loss of the Leeds and Thirsk Bill, according to Dr. Smiles,† was due to an agreement made with the Curators of the Durham Observatory. The line, as first laid out, came too near the Observatory; and the Curators, supposing that the working of the heavy locomotive engines would cause some aberration of the instruments, resolved to oppose the measure. To get rid of their opposition, the Leeds and Thirsk Company agreed, in the event of an Act being obtained, not to make the line past the Observatory, but to apply for powers, in a future session of Parliament, to carry it through the City of Durham. The agreement was read before the Committee of the House of Commons, and there was an end of the application and of the Company's hopes of securing an inde-

* *Yorkshire Gazette*, 19th June, 1847.

† *Autobiography of Samuel Smiles, LL.D.*, 1905, p. 176.



Lithographed by Neuman & Co., London.

Whitby from the Mount, showing Railway Station and the West Cliff.

pendent access to Newcastle. On the 1st of July, the third portion of the Newcastle and Berwick Railway, between Morpeth and Chat-hill ($29\frac{1}{2}$ miles) was opened for traffic, the trains running through from Newcastle to Tweedmouth. The principal engineering works on the line, the bridges over the Blyth, the Wansbeck, the Coquet and the Aln—each a series of brick arches with stone facings supported on stone piers—were not completed at this time, the railway being carried over these rivers by temporary structures of wood which served as platforms in the building of the permanent works. Five of the smaller bridges were on the skew principle, one of these, a three-arched bridge, crossing the Benton road at an angle of 54 degrees.* The terminus at Newcastle was the old Newcastle and North Shields station in Carliol Square. Through passengers were conveyed between this station and Gateshead by omnibus.† Picturesque features of the railway were the roadside stations, designed by Benjamin Green of Newcastle, in the Elizabethan style. An event which followed close on the opening of the railway was the disappearance of the old mail coach from the Edinburgh road. It arrived at the Queen's Head Inn, Newcastle, for the last time on the 5th of July, 1847, and as it passed through the town to Gateshead, a flag surmounted with crape was hoisted on its roof.‡

Early in July, 1847, the York and Newcastle Company obtained power to make a dock at Jarrow Slake and enlarge their Wearmouth Dock, to construct a number of short lines—the Pelaw, Tyne Dock, Easingwold and other branches and to amalgamate with the Newcastle and Berwick Railway Company. One reverse they experienced—the loss of the Bill confirming the agreement for the lease and purchase of the Hartlepool Dock and Railway and the Great North of England, Clarence and Hartlepool Junction Railway. The powers conferred by the Act 10 and 11 Vic. cap. 133 were exercised on the 9th August, 1847, when the two Companies were amalgamated under the title of the York, Newcastle and Berwick Railway Company.

The York and North Midland, like the York and Newcastle, Company had come into conflict with the Leeds and Thirsk Company obtaining, in direct competition with them, Parliamentary powers to make a branch line

* *Yorkshire Gazette*, 19th June, 1847.

† The luggage was passed from the platform to the omnibus and from the omnibus to the platform through an opening in the high retaining wall at the south-east corner of Carliol Square. This opening has now been filled up, but the outlines are still clearly traceable.

‡ *Yorkshire Gazette*, 10th July, 1847.

from Harrogate to Knaresborough and Boroughbridge ($10\frac{1}{2}$ miles). They were also authorised to extend the line of their Harrogate Branch Railway ($1\frac{3}{4}$ mile), to make a station at Hull and certain branch lines there ($4\frac{3}{4}$ miles), to construct a short line between Burton Salmon and Knottingley ($3\frac{1}{4}$ miles), and to purchase the Pocklington, Market Weighton, Sir Edward Vavasour's, and the Leven Canals, according to arrangements previously made with the proprietors who would otherwise have opposed their East Riding Branches Bill. The significance of the Knottingley curve will be perceived when it is stated that, at this time, the Great Northern Company were carrying their line from Doncaster to Askern and that the Wakefield, Pontefract and Goole Company were making a branch from Askern to Knottingley. Ostensibly the object of the curve was to give the York and North Midland Company access to the Knottingley lime country and to bring the population there into railway connection with Leeds and Hull, but there can be no doubt, in the light of subsequent events, that George Hudson was already contemplating an arrangement with the Great Northern Company by which, instead of continuing the line to York, they would work their traffic northward by way of Askern, Knottingley and the York and North Midland Railway.

The York and North Midland Company were now in the happy position of having got all they could get. The Acts which they had obtained comprised all the powers applied for, with the exception of those for subscribing to the Axholme Railway, and the limits of profitable expansion had been reached. All that was left for the Company to do was to complete their works and develop the traffic of the districts which they served. The Whitby line was now adapted to locomotive engines. Part of the line between Pickering and Raindale had been worked by locomotive engines since August, 1846,* but it was not until the 1st July, 1847, that the reconstruction of the rest of the line was completed. The new works consisted of a larger tunnel at Goathland, a stone bridge at Grosmont, five iron girder bridges over the Esk, and a timber bridge at Ruswarp, 340 feet long. The Goathland incline was no longer self-acting, but worked by a stationary engine of 40 horse-power.† The line at this time did not pay the interest on the purchase-money, and there was every likelihood of the money expended in converting it into a locomotive line remaining unproductive. To increase the traffic on the line, Mr. Hudson saw that it would be necessary to develop Whitby as a fashionable watering-place. With the object of

* *Herapath's Journal*, 1846, p. 1061.

† *Yorkshire Gazette*, 12th June, 1847.



Sketched by Thomas Thorpe.

HARBOUR AND DOCK, WEST HARTLEPOOL, AS OPENED IN 1847.

W. Monkhouse, lith.

providing more accommodation for visitors, he started the Whitby Building Company, who, having acquired the West Cliff Fields, proceeded to cover them, in 1847, with streets and terraces. In August and October, 1847, 48 miles of additional railway were opened for traffic, viz., from Church Fenton to Spofforth ($13\frac{3}{4}$ miles) on the 10th August, from York to Market Weighton ($21\frac{1}{2}$ miles) on the 3rd October, and from Filey to Bridlington ($13\frac{3}{4}$ miles) on the 18th October.

A third group of railways was formed under statutory authority on the 29th September, 1847, consisting of the Stockton and Darlington Railway, the Wear Valley Railway (a union of the Wear Valley Railway—opened on the 3rd August, 1847—the Bishop Auckland and Weardale Railway, the Wear and Derwent Railway, the Weardale Extension Railway and the Shildon Tunnel) and the Middlesbrough and Redcar Railway; the two latter railways being leased by the Stockton and Darlington Company for 999 years, from the 1st October, 1847, at a rental equivalent to 6 per cent. on the share capital. Outside of these three groups there remained only the Newcastle and Carlisle Railway, now completed by the opening, on the 24th May, 1847, of the little belated Swalwell Branch ($\frac{3}{8}$ mile); the associated Stockton and Hartlepool and Clarence Railways, to which the Hartlepool West Harbour and Dock—opened on the 1st of June, 1847, on the Stranton shore—gave increased importance; the Leeds and Thirsk and Blyth and Tyne Railways; and a few unattached lines.

An event affecting many interests was the completion of the West Coast route by the opening of the Caledonian Railway on the 14th February, 1848. Immediately afterwards, the spirit of rivalry manifested itself. A special express, commissioned by Messrs. W. H. Smith and Sons, had run from London to Beattock in November, 1847 (339 miles) at an average speed, deducting stoppages, of 40 miles an hour. This was considered a great feat at the time. On the 19th of February, 1848, however, the East Coast Companies conveyed, by special express for the same enterprising firm, the newspapers containing Lord John Russell's budget speech of the previous night from London to Glasgow, a distance of $472\frac{1}{2}$ miles, in 10 hours 22 minutes. The actual time of running was 9 hours 37 minutes, which gives an average speed of 49 miles an hour. The highest rate of speed attained was 56 miles an hour between Derby and Normanton, this record being achieved by an engine manufactured by Messrs. E. B. Wilson and Co., of Leeds. Between Normanton and Darlington, the average speed was 50 miles an hour. How rapid, comparatively, the journey had been was shown by the

fact that the express arrived at Edinburgh an hour and a half and, at Glasgow, two hours before the mails, which left London the preceding evening.*

A month later the Caledonian Company opened negotiations with the Newcastle and Carlisle Company for a lease of their line, a step which showed to Mr. Hudson that the possession of this line was of vital importance to the interests of the York, Newcastle and Berwick Company. He, therefore, made proposals of a similar nature to the Newcastle and Carlisle Company, and, on the 31st May, 1848, that Company accepted his offer in preference to the offer made by the Caledonian Company, the terms of the arrangement being 6 per cent. per annum for three years and 7 per cent. in perpetuity afterwards.† In accordance with the agreement, dated 5th July, 1848, the York, Newcastle and Berwick Company took possession of the railway from the 1st August. For some time the Newcastle and Carlisle Company had been negotiating with the Maryport and Carlisle Company for a lease of their line, but without being able to come to terms with them. Mr. Hudson was more successful, and secured a lease at 4 per cent. from the 1st October, 1848.‡ After the failure of the first application to Parliament for power to lease and purchase the Hartlepool Dock and Railway the terms were altered from 10 per cent. to 8 per cent. for 31 years, from the 1st July, 1846, upon a maximum capital of £440,570, and amalgamation upon equal terms at the expiration of this period, and this arrangement received Parliamentary sanction on the 22nd July, 1848. The collapse of the Northern Coal Mining Company and the financial straits of some of its leading members enabled Mr. Hudson to secure the shares which they held in the West Durham Railway Company—2,937 out of 4,771, and to get the entire control of the line. Five of the seven directors appointed on the 22nd August, 1848, were members of the York, Newcastle and Berwick Board, the chairman elected being Mr. Hudson himself.§ Negotiations had taken place in 1847 between Mr. Hudson and the directors of the East and West Yorkshire Junction Company, but his offer had been rejected in favour of an offer from the Leeds and Thirsk Company, who, subsequently, obtained an act for the amalgamation of the two undertakings. In October, 1848, the East and West Yorkshire Junction Company, thinking, with good reason, that the Leeds and Thirsk Company were trying to back out of their engagements, sent a deputation to re-open negotiations with

* *Newcastle Journal*, 26th February, 1848.

‡ *Yorkshire Gazette*, 16th September, 1848.

† *Latimer's Local Records*, p. 246.

§ *Gateshead Observer*, 26th August, 1848.

Mr. Hudson.* A provisional arrangement was made with him for the working of the traffic by the York, Newcastle and Berwick Railway Company, and soon afterwards—on the 30th of October, 1848, the line was opened from Poppleton Junction to Haypark Lane within half a mile of Knaresborough—the works beyond being yet unfinished owing to the fall, on the 11th March, 1848, of the Nidd Viaduct, when just on the point of completion. George Hudson was at this time discussing terms with the Stockton and Darlington Company for the transfer of their railway,† and, by the 6th of November, negotiations had reached such a stage that it was possible for the Stockton and Darlington Company to give notice of the introduction of a bill for the leasing of their line to the York, Newcastle and Berwick Company, and the amalgamation of the two undertakings.‡ An agreement had practically been arrived at on the basis of a guarantee of £15 per share per annum equal to about 9 per cent. per annum on the average amount paid by the proprietors,§ but it was never completed owing to the crisis which occurred in the affairs of the York, Newcastle and Berwick Company in 1849.

We can now see in its broad outlines the great railway system which George Hudson intended to create, reaching from Edinburgh to Normanton and Doncaster, and even to the Isle of Axholme (which has only recently been added to the North Eastern territory) from Maryport to Monkwearmouth and from Hull to Leeds. One Company only had broken through the cordon—the Leeds and Thirsk—but the sphere of its competitive activity had been successfully circumscribed. Two miles of the Northern Counties Union Railway, from Wath to Bedale, followed nearly the same course as the Leeds and Thirsk extension to Northallerton, and an arrangement had been made between the two Companies that this portion of the line should be made at their joint expense for their joint use. As this branch would enable the Leeds and Thirsk Company to tap the Wensleydale district, Mr. Hudson made an attempt to get the works stopped. A branch from Northallerton was already approaching Bedale, and he proposed that, if the Northern Counties Union Company would abandon their branches to Wath and Thirsk, and in conjunction with the Liverpool, Manchester and Newcastle Junction Company make a line from Bedale to Aysgarth, the York, Newcastle and Berwick Company would take a lease of such line for 21

* *Yorkshire Gazette*, 21st October, 1848.

† *Herapath's Journal*, 28th October, 1848.

‡ *Yorkshire Gazette*, 11th November, 1848.

§ *Stockton and Darlington Report*, 15th August, 1849.

years at 5 per cent. on the outlay, but his offer was rejected* and the Northern Counties Union Company proceeded with their works which, after all, they were never destined to finish. A portion of the Leeds and Thirsk Railway between Thirsk Town and Ripon ($9\frac{3}{4}$ miles) with the loop to Thirsk Junction ($\frac{1}{2}$ mile) was opened for goods and minerals on the 5th January, 1848† and for passengers on the 31st May.‡ A second portion between Wormald Green and Weeton ($12\frac{3}{4}$ miles) was brought into use on the 1st September§ and, on the 13th September, the whole line between Thirsk and Weeton,



PARAGON STATION, HULL.

a distance of $27\frac{1}{2}$ miles, was formally opened.|| Passengers from the north for Harrogate alighted at Starbeck station, a mile from the town, and were then conveyed by omnibus to their destination.¶ Up to this time the Leeds and Thirsk Railway was a useful feeder of the York, Newcastle and Berwick Railway.

* York, Newcastle, and Berwick Minutes, 8th November, 1847.

† *Eastern Counties Herald*, 13th January, 1848.

‡ *Yorkshire Gazette*, 3rd June, 1848.

§ *Ibid.*, 9th September, 1848.

|| *Herapath's Journal*, 1849, p. 325. The traffic superintendent of the line at this period was Mr. Henry Tennant, who also held the office of accountant; the secretary of the Company was Mr. Samuel Smiles—now so widely known as the biographer of George Stephenson—who, before joining the Leeds and Thirsk Company, had edited a newspaper, and practised as a doctor, in Leeds.

¶ *Gateshead Observer*, 30th September, 1848.

Reviewing the course of railway progress in 1848, George Hudson had every reason to be satisfied with the results achieved. At Hull the traffic had outgrown the old station. A new station had been built in Paragon Street and opened, with $4\frac{1}{2}$ miles of railway connecting it with the Hull and Selby and Hull and Bridlington lines, on the 8th May, 1848. This station, designed by Mr. G. T. Andrews of York, covered an area of nearly



Andrew Reid, del. et lith.

MONKWEARMOUTH STATION.

$2\frac{1}{2}$ acres. It was built according to the usual plan—a range of buildings of polished stone in front containing the offices, the central block distinguished by a colonnade—the station shed behind with iron roof in three spans, covering platforms 465 feet long and 30 feet wide.* The old station in Railway Street was transformed into a goods station. An export trade in coals had already begun at Hull; the coals were shipped in the Humber Dock, and also at the new staith on the Humber foreshore near Limekiln

* *Herapath's Journal*, 1848, p. 524 ; *Sheahan's History of Hull*, 1866, p. 679.

Creek.* Trains were now running to Harrogate, the remaining portion of the Church Fenton and Harrogate Branch between Spofforth and Harrogate ($4\frac{3}{4}$ miles) having been opened on the 20th July, 1848. Crossing the Crimple Valley at a height of 110 feet, by a great viaduct of 31 arches, each 50 feet in span, built of brick with stone facings on stone piers, the line reached Low



G. B. Richardson, del

Engraved by John Christie.

RAILWAY ARCH OVER DEAN STREET, NEWCASTLE.

Harrogate on the south, terminating near the Brunswick Hotel. The line from Selby to Market Weighton ($16\frac{1}{4}$ miles) had been opened on the 1st August, 1848, and the most difficult part of the line from Copmanthorpe to Tadcaster accomplished—the crossing of the valley of the Wharfe by a viaduct of eleven arches. The Bedale Branch of the York, Newcastle and

* *Yorkshire Gazette*, 2nd December, 1848.

Berwick Railway had been opened as far as Leeming Lane ($5\frac{1}{2}$ miles) on the 6th March, 1848, the extension of the Brandling line at Monkwearmouth to the little stone-built station of classic design near the Wear Bridge ($\frac{3}{4}$ mile) on the 19th June, the temporary bridge over the Tyne with the permanent approaches to it comprising, among other interesting features, the fine elliptical arch of 80 feet span over Dean Street, Newcastle, on the 29th August, and the temporary viaduct over the Tweed on the 10th October. The completion of the east coast line of communication between London and Edinburgh was the culmination of a long series of railway achievements; it was also the climax of a great railway career.



SEAL OF LEEDS NORTHERN RAILWAY COMPANY.

CHAPTER XIV.

 THE FALL OF GEORGE HUDSON AND THE GREAT AMALGAMATION.
 1848—1854.

The welding together of the various interests represented by the York, Newcastle and Berwick, and York and North Midland Railways was entirely the work of George Hudson. Far-seeing, resourceful, energetic and self-confident, he had entered into agreement after agreement with the certainty that his decisions would be unhesitatingly ratified. While prosperity attended his rule, no one dreamed of questioning his authority. The members of the several boards over which he presided were pliant in his hands. Dominated by his personality, they supported his policy and shared the responsibility for acts of which many were open to very severe criticism. His name was associated with success. Yet it is curious to notice a feeling of insecurity beginning to show itself among investors so early as 1846. "The York and North Midland," wrote Charlotte Brontë to Miss Wooler on the 30th January of that year, "is, as you say, a very good line, yet I confess to you I should wish for my part to be wise in time. I cannot think that even the best lines will continue for many years at their present premiums and I have been most anxious for us to sell our shares ere it be too late and to secure the proceeds in some safer, if for the present less profitable, investment."* At this time the York and North Midland Company were paying 10 per cent. and the Newcastle and Darlington Junction Company 9 per cent. In the half-year ending 31st December, 1848, the dividends of both Companies dropped to 6 per cent., and shareholders began to scrutinise the accounts.

On the 20th February, 1849, a question was raised at the half-yearly meeting of the York, Newcastle and Berwick Company by Mr. Robert Prance, of the London Stock Exchange—a question which resulted in the downfall of George Hudson. It had reference to the Great North of England Purchase Account. The average price paid for certain of the shares was excessively

* *Charlotte Brontë and her Circle*, by C. K. Shorter, p. 132.

high. Someone had evidently disposed of his shares to the Company at a premium which had never been reached on the Stock Exchange. What were the particulars of the transaction? All eyes were turned towards the chairman. Most of these shares, he admitted, had been sold by himself at a price based on an estimate of the value prepared by Mr. N. Plews, one of the directors.* If a mistake had been made he would at once have it rectified or refund the money with interest and take back the shares. The question, as Mr. Prance pointed out, was not one of money but of reputation and, after some demur at first from the chairman, a Committee of Inquiry was appointed to investigate the matter.† The Committee took the view that Mr. Hudson, standing in the relation of trustee to the Company, had acted improperly in selling the shares at a profit and expressed the opinion that the sum charged by Mr. Hudson ought to be reduced to the sum which he actually disbursed and the difference repaid with interest.‡ Mr. Hudson refused to accept this view of the Committee, protesting that he never thought himself restrained from entering into personal engagements either with the Company or with others by reason of the position in which he stood towards the Company any more than if he had been an ordinary proprietor. So far, indeed, from considering himself in the light of a trustee, and thereby disqualified from acting in any other character, he had never hesitated to take upon himself great personal responsibility when the interests of the Company required it. If the view of the Committee were correct then, he maintained, the proper course to adopt was to cancel the whole transaction.§

Up to the 26th October, 1846, when a guaranteed stock was created to provide for the purchase of the Great North of England Railway and works, Mr. Hudson had an undoubted right to buy shares for himself, but, in selling the shares to the Company at a profit, while still retaining his position as chairman, he committed a grave error of judgment. This, however, may be said on his behalf, that it was to the advantage of the Company to purchase the shares at the market price of the day, and there is evidence to show that but for an unfortunate error on the part of the secretary, the price actually charged would have closely approximated to it. By holding his shares until 1850, Mr. Hudson might have realised a large profit and no one could have cavilled at the transaction, for the Company were bound to redeem these

* Report of Committee of Inquiry on the Great North of England Purchase Account, March 29th, 1849.

† *Yorkshire Gazette*, 24th February, 1849.

‡ *Herapath's Journal*, 1849, p. 371.

§ *Ibid.*, p. 387.



From a lithograph by Gibson & Co., York, 1847.

THE CRIMPLE VIADUCT.

shares at that time at a guaranteed premium. The Hull and Selby Purchase Account of the York and North Midland Company also showed that Mr. Hudson had sold shares to that Company at a higher price than he had paid for them, and the transaction, with his assent, was cancelled.

It was now found necessary to extend the field of inquiry, and committees of investigation were appointed in May by the shareholders of the York, Newcastle and Berwick and York and North Midland Companies with power to call for the production of all books and documents. The same month Mr. Hudson resigned his position on both Boards. The reports of the Committees of Inquiry proved disastrous to his reputation. One of the charges brought against him was that, having purchased 10,000 tons of rails at £6 10s. 0d. per ton, he had sold them to the Companies, of which he was chairman, at £12 per ton. The fact seems undeniable that he contracted for the rails on his own account and at his own risk. One of his colleagues was asked to join in the speculation, and a large ironmaster offered him £50,000 for his bargain. He could easily have sold the rails elsewhere. But his fiduciary relations with the Company made improper a transaction which, on the part of anyone else, would have been free from criticism. That the Company did not lose, or may even have gained some advantage, from the sale did not justify the illegality of the proceeding. A further charge was that, having received a number of cheques in favour of sundry land-owners and contractors, he had applied them to other purposes, paying one into the bank to the credit of the York and North Midland Construction Account, a second to the credit of another Railway account and the rest to the credit of his own personal account. While Mr. Hudson cannot be said to have justified the irregularity, his account of it deserves, perhaps, to be stated. Most of the negotiations with the land-owners were conducted entirely by himself, and it was customary for him to settle their claims. In these transactions difficulties were apt to arise at the last moment, and a misunderstanding with regard to the price or a question about a title sometimes made it necessary to defer payment. On more than one occasion Mr. Hudson had settled claims for land out of his own pocket, and he had at times been largely in advance to the York, Newcastle and Berwick Company. He had also made himself personally responsible for advances granted by the bank to the contractors—one firm having been allowed to overdraw their account to the extent of £50,000—and three of the cheques paid into his own private account were retained for his own protection.

The unauthorised appropriation of shares to himself was another of the charges brought against Mr. Hudson. A certain number of surplus shares—shares remaining over after a *pro rata* division had been made among the proprietary—were generally “placed at the disposal of the directors,” which, in practice, meant at the disposal of the chairman. Many difficulties, it was found, could be smoothed away by the diplomatic allotment of shares among land-owners and other persons whose interest it was desirable to secure. It was the time of the railway mania. Everyone was looking out for railway shares, and would have them in one line or another, as Mr. Hudson said, either for you or against you. Many services were rewarded by an allotment of shares: directors, engineers, secretaries and managers participated in this indirect mode of payment. Naturally, Mr. Hudson, who was labouring from morning to night on behalf of the Companies with which he was connected—planning, organising, negotiating and beating down opposition with an energy almost unparalleled—felt himself entitled to a large share of the benefits accruing from his efforts. The value of his services it would be difficult to exaggerate. No professional man would have undertaken many of the duties which Mr. Hudson performed without a very large remuneration. By his judgment and foresight, Mr. Hudson must have saved the York and North Midland and York, Newcastle and Berwick Companies enormous sums of money. It is not without significance that, while the cost of land on the York and North Midland and the Newcastle and Darlington Junction Railways was about £2,400 per mile, on the lines adjoining them—the Hull and Selby, Leeds and Thirsk and Great North of England Railways—it was between £3,600 and £3,800 per mile. He purchased the Brandling Junction Railway on such favourable terms that one of the shareholders of this line wrote a pamphlet to show the inadequacy of the price given for it. He bought the West Durham shares on his own responsibility, advancing the money to pay for them. How judicious this purchase was—to say nothing of the policy of getting control of the line—may be gathered from the fact that the dividends received in respect of these shares between 1855 and 1866 exceeded the amount of the investment. By purchasing the Londesborough estate at a critical time he frustrated the designs of opponents and protected the interests of the York and North Midland Company. The value of the service is not diminished by the fact that the estate was probably worth to Mr. Hudson what he paid for it. It was to benefit the railway by increasing the traffic

upon it that Mr. Hudson founded the Whitby Building Company, risking £10,000 in the enterprise. With a sense of their obligations to Mr. Hudson, the York and North Midland Company, on the 17th November, 1843, awarded him 350 surplus Scarborough shares. The Newcastle and Darlington Junction Company, from what took place at a general meeting on the 4th February, 1845, clearly intended him to have 2,000 surplus shares created for the purchase of the Brandling Junction Railway, though the resolution embodying the will of the meeting placed them "at the disposal of the directors." Taking it for granted that these shares had been presented to him, Mr. Hudson distributed 400 of them among certain directors and engineers, and then swept the remaining 1,600 into his own capacious coffer. He also took without authority 950 York and Newcastle Extension shares and 1,700 East and West Yorkshire Extension shares, allotting them to himself in his several capacities of chairman, landowner and shareholder in the Whitby Building Company. He further appears to have appropriated to his own use the extraordinary number of 10,894 Newcastle and Berwick shares, justifying his claim to them on the ground that they did not exceed the number for which he had executed the subscription-contract. It was brought out in evidence, however, that he signed for the majority of the shares, not on his own account, but on behalf of the Company as a mere matter of form in order to comply with the standing orders of Parliament.

One result of the inquiry was to show that, for some years, the accounts of the two companies had been systematically "arranged"—to use a mild term—"in order to make things pleasant." By inflating the traffic returns, and charging to capital items which properly belonged to revenue, Mr. Hudson had been able to represent the amount available for dividend as larger than it really was. Metaphorically speaking, he drew a bill on the future which the future was unable to meet. Unforeseen circumstances arose to affect railway receipts—the depression in the coal trade which followed the break-up of the old system of regulating the vend, the monetary crisis in the country, the Danish blockade, etc. The disclosure of the true state of affairs sent down the price of York, Newcastle and Berwick and York and North Midland shares with a rush. Shareholders who had kicked when the dividend fell to 6 per cent. got no dividend at all for the first half year of 1849 and a very trifling one for the second half-year— $2\frac{3}{4}$ per cent. if they belonged to the York, Newcastle and Berwick Company, and 2 per cent. if they belonged to the York and North Midland Company. The loss of

dividend and the depreciation in value of their stocks made the shareholders of the two companies very bitter against Mr. Hudson, and they demanded restitution, calling upon him to account for the premiums on the shares which he had appropriated to himself without sanction, and also for the profits realised on the rail transactions. The York, Newcastle and Berwick Company received £90,036 from him in 1849, and, in 1850, agreed to accept the sum of £50,000 in full satisfaction of all further claims upon him.* A number of additional shares in the Sunderland Dock Company, which he had purchased without authority, in order to secure for the company a greater controlling power in the management of the dock, were thrown back on his hands, though the West Durham shares acquired in a similar manner were somewhat inconsistently retained.

The York and North Midland Company preferred claims against him amounting to nearly £100,000. Some of these he met by a payment of £26,083, others he offered to refer to arbitration, but his proposal was rejected. As the matters in dispute could not be arranged satisfactorily, bills were filed against him in the Court of Chancery. Eventually, the Company recovered a further sum of £46,614.† After these inquiries and proceedings, the world, losing sight of the great work which he had accomplished, came to regard him rather as the leading character of the play, "Railway Bubbles,"‡ than as the strenuous builder of railway systems. "It is a great mistake," said Mr. Gladstone on one occasion, "to look back upon him as a speculator. He was a man of great discernment, possessing a great deal of courage and rich enterprise,"—"a very bold, and not at all an unwise, projector."

The financial position in which the two companies found themselves made it expedient to curtail as much as possible the expenditure on capital account, especially as one of the Committees of Inquiry had shown that the branch lines were the chief cause of reduced dividends. They therefore decided to postpone the execution of several branches for which they had obtained powers—the Thirsk and Malton, Team Valley, Auckland, Blyth, Knaresborough and Boroughbridge, Market Weighton and Beverley, Hornsea and Castleton branches. The works on the Copmanthorpe and Tadcaster branch and the excavations for the Tyne Docks were suspended—

* *Herapath's Journal*, 1850, p. 21.

† York and North Midland Report, 17th February, 1854.

‡ The play was performed at the Theatre Royal, Newcastle, on the 9th March, 1846, the part of George Hudson being taken by Mr. Eugene Macarthy.

the former to remain unfinished even to the present time, a costly monument of the days of the railway mania, the latter to be resumed after the lapse of a few years.

About 30 miles of new railway were opened for traffic by the York, Newcastle and Berwick Company in 1849 and $11\frac{1}{2}$ miles by the Leeds and Thirsk Company. The additional portion of the Leeds and Thirsk line brought into use extended from Leeds to Weeton. The opening ceremony took place on the 9th July, 1849, when three trains, containing from 1,700 to 2,000 of the shareholders and officers of the company, travelled over the whole line from end to end. The Leeds and Thirsk Railway enriched the North of England with some remarkable engineering works—the Bramhope Tunnel, cut through shale and sandstone, 3,763 yards in length, $25\frac{1}{2}$ feet in width and 25 feet in height from the formation level, with four ventilating shafts 40 feet by 30 feet internal diameter, and the great stone viaducts over the valleys of the Aire, the Wharfe, the Crimble, and Nidd, consisting respectively of 23, 21, 10 and 7 arches, the span of the arches over the Aire being (with one exception) 48 feet each, of those over the Wharfe 60 feet, and of those over the Crimble valley and Nidd 50 feet. In addition to these works there were two smaller tunnels, 70 and 100 yards long, a timber viaduct of 14 openings over the river Ure, embankments, 47, 51, 60, 61, and 70 feet high and cuttings 47, 49, 60 and 126 feet deep. Some of the gradients were heavy, averaging, for a distance of $3\frac{3}{4}$ miles, chiefly between Headingley and Horsforth, 1 in 100 and for a distance of 3 miles between Horsforth and Arthington, 1 in 94.* The engineer of the line was Thomas Grainger, of Edinburgh, who, in the construction of the Bramhope tunnel, had to contend with an enormous influx of water, the quantity pumped out, it is estimated, amounting to no less than 1,563,480,000 gallons.†

The first of the York, Newcastle and Berwick lines to be opened in 1849 was the Kelso branch as far as Sprouston (20 miles) on the 27th July. On the 15th August trains began to cross the permanent bridge over the Tyne which was formally opened by Queen Victoria on the 28th of September, on her way south from Scotland. The removal of the timber framing which had served as a temporary bridge, revealed a structure of novel and picturesque design, 1,337 feet in length and 112 feet in height from high water

* *Report of the Commissioners of Railways, 1849*, pp. 52 and 53: *Yorkshire Gazette*, 14th July, 1849.

† *Builder*, 21st July, 1849.



Drawn and lithographed

High Level Bridge, Newcastle-upon-Tyne.

W. Boozell.

mark to the level of the rails, consisting of a harmonious combination of cast-iron arches, pillars and diagonal bracing. The ribs of the arches, arranged in pairs, each 125 feet in span, rested on piers of a peculiarly light construction, wrought-iron tension chains or ties taking the lateral thrust. The square hollow pillars rising from the ribs supported a longitudinal trough girder which sustained the weight of the cross-bearers and upper roadway. From this girder was suspended the lower roadway by means of wrought-iron rods passing through the pillars which, being extended below the ribs, afforded additional stiffness to the roadway.* The first segment of the first arch had been fixed on the 10th July, 1848, and the last key driven into its place on the 7th June, 1849. The weight of iron used in the construction of the bridge was 5,050 tons, and the cost of the whole structure, exclusive of land and compensation, £243,000.† The lower roadway, 22 feet $7\frac{1}{2}$ inches below the rails, was not opened until the 4th February, 1850. The Washington branch (5 miles) was opened for mineral traffic on the 1st September, 1849, and the Amble or Warkworth Harbour branch (5 miles), also for mineral traffic, on the 5th September, when coals from Earl Grey's new colliery at Broomhill passed along it for shipment at Amble.‡

In the financial condition of the York, Newcastle and Berwick Company it was impossible for them to raise the enormous sum required to complete the purchase of the Great North of England Railway on the 1st July, 1850, and an arrangement was therefore made on the 23rd November, 1849, with the proprietors of that railway (afterwards legalised by Act of Parliament) for spreading the payment over a period of six years, the first instalment being due in 1853, the second in 1855, and the third in 1856.§ Part of the constructive work of George Hudson was undone by the shareholders of the York, Newcastle and Berwick Company in the autumn of 1849. Parliament having withheld its sanction from the leasing arrangements which he had made with the Newcastle and Carlisle and Maryport and Carlisle Companies, it was decided to repudiate the agreements, and the lines, after being worked for a few months by Mr. Hudson, reverted to their original owners on the 1st January, 1850.|| As the terms on which the Newcastle and Carlisle Railway was subsequently united with the North Eastern Railway gave the Newcastle and Carlisle section of shareholders $7\frac{1}{2}$, 8 and $8\frac{1}{4}$ per cent., and

* *Report of the Commissioners of Railways, 1849*, pp. 83-85.

† *Latimer's Local Records*, p. 268.

§ *Herapath's Journal*, 1850, p. 20.

‡ *Newcastle Chronicle*, 14th September, 1849.

|| *Ibid.*, 1850, pp. 334 and 336.

as the dividends earned by the Maryport and Carlisle Railway afterwards rose to 10½, 12 and even 13 per cent., it is evident that, in recommending the repudiation of the agreements, the gentlemen composing the Committee of Inquiry showed little of Mr. Hudson's sagacity and foresight. One of the last, and also one of the most politic of the agreements which George Hudson had made before his downfall, gave the Great Northern Railway Company running powers over the York and North



TUBULAR BRIDGE OVER RIVER AIRE AT BROTHERTON.

Midland Railway between Knottingley and York on condition that they should relinquish the right of making their line between Askern and York. This agreement involved the construction of a short link-line between the York and North Midland main line and the Askern branch of the Lancashire and Yorkshire Railway, over which the Great Northern Railway Company had obtained running powers. After Mr. Hudson's downfall, Mr. Denison, the Chairman of the Great Northern Company, got the terms modified; these, as finally ratified, being 20 per cent. more favourable to the Great

Northern Company than the terms of the first agreement. For the use of the York Station the Great Northern Company agreed to pay a rental of £1,000 a year and, for the use of the line, to hand over £60 out of every £100 which they earned upon the line (after first deducting the Government duty), reserving £40 to themselves.* The two companies, it was understood, were cordially to co-operate with each other and throw whatever traffic they could upon each other's line. The Knottingley branch (3 miles) was opened for local traffic in April, 1850†—a temporary wooden viaduct carrying the line over the river Aire until the completion, a year later, of Robert Stephenson's tubular girder bridge—and in August, after the opening of the Great Northern line from London to Peterborough, the Great Northern trains began running into York.‡

If the York and North Midland Company imagined that they could form a defensive compact with the Great Northern Company and, at the same time, retain their position as partners in a rival route they were destined to be quickly undeceived. The admission of the Great Northern Company into the East Coast alliance was regarded at Euston Square and Derby as an act of puny perfidy on the part of the York and North Midland Company and a strong combination, consisting of the London and North Western, Midland and Manchester, Sheffield and Lincolnshire Companies, was formed against the Great Northern and York and North Midland Companies. According to the plan of the "Euston Square confederates," as they were styled, traffic was to be diverted from the York and North Midland Railway by being sent, the north and south traffic *viâ* the Leeds and Thirsk Railway, the London and Hull traffic *viâ* the Manchester, Sheffield and Lincolnshire Railway, crossing the Humber by boat. The proceeds, after taking out a certain sum for expenses, were to be divided *pro rata* among the combining companies.§ Application was made to the Lancashire and Yorkshire and York, Newcastle and Berwick Companies; but they both refused to join the coalition. The York, Newcastle and Berwick Company, even if there had not been a close affinity between the York and North Midland Company and themselves, were scarcely likely to consent to have the traffic cut off from 22½ miles of their railway. The two companies were united by a common bond of interest. They were fighting for the same object—to keep the traffic between Leeds and the North in the old channel. Every means at their disposal was employed to force the traffic round by York and prevent it

* *Herapath's Journal*, 1850, pp. 839-842.

† *Herapath's Journal*, 1851, p. 256.

‡ *Yorkshire Gazette*, 30th March, 1850.

§ *Ibid.*, 1850, p. 415.

from taking the shortest route by the Leeds and Thirsk Railway.

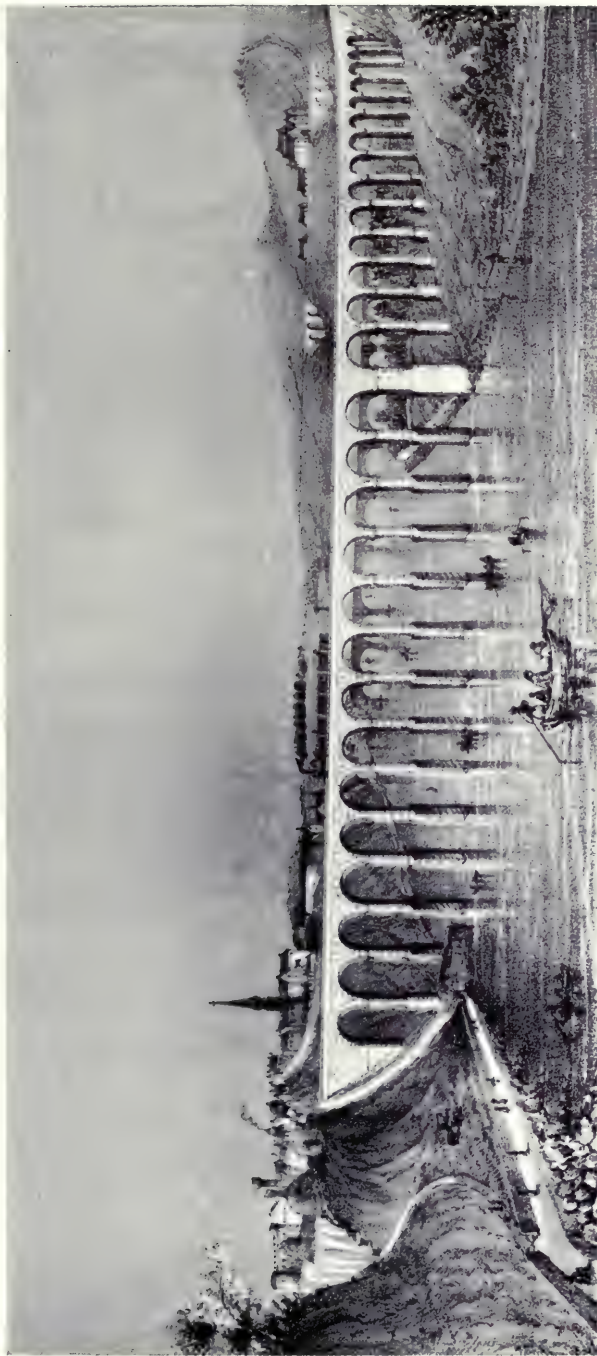
Though the York, Newcastle and Berwick Company were not authorised to levy a higher toll than $\frac{3}{4}$ d. per ton per mile upon coals or coke passing over their line to places south of York, they had Parliamentary powers to charge $1\frac{1}{2}$ d. per ton per mile in respect of the same traffic when the distance over which it was conveyed did not exceed 30 miles. If consigned to Leeds *viâ* the Leeds and Thirsk Railway, they simply imposed the local rate from Darlington to Thirsk Junction, a distance of $22\frac{1}{2}$ miles, viz., 2s. 9 $\frac{3}{4}$ d., which was precisely the same as the charge from Darlington to York *through*, a distance of 45 miles. It was thus dearer to send minerals from Darlington to Leeds *viâ* the Leeds and Thirsk Railway (61 miles) than *viâ* York (76 miles). The same methods were adopted with regard to goods traffic, the York, Newcastle and Berwick Company charging local rates from Thirsk Junction northwards on goods coming off the Leeds and Thirsk Railway instead of the through rates from Leeds. Cattle-trucks were not allowed to go forward from one line to the other. On arriving at the junction they were unloaded and the animals driven off the premises, the latter having to travel over a mile by road before they could be transferred to the Leeds and Thirsk trucks. Notices were sent to certain railway companies southwest of Leeds, intimating that in future the York, Newcastle and Berwick Company would decline to accept through invoices with either cattle or goods sent by the Leeds and Thirsk Railway. Passengers were obliged to change carriages at the junction, sometimes in considerable discomfort, as no shelter was provided on the east platform. At Darlington the Leeds and Thirsk line was represented as an inconvenient and expensive one and tickets to Leeds *viâ* York were often issued to passengers intending to travel *viâ* the Leeds and Thirsk line.* On the occasion of the meeting of the Yorkshire Agricultural Society at Thirsk, on the 8th of August, 1850, passengers were carried from Leeds to Thirsk for the show *viâ* York (106 miles) for 3s., 2s., and 1s., and *viâ* Ripon (78 miles) for 2s. 6d., 1s. 9d. and 9d.† The question of a traffic arrangement was discussed by the two Companies, but they failed to come to a satisfactory understanding. The only policy left to the Leeds and Thirsk Company was, therefore, to complete, as quickly as possible, the connection with the mineral railways of Durham and the ports of the Tees. An important agreement between the York

* *Report of the Commissioners of Railways, 1850, Appendix, pp. 319-329.*

† Mayhall's *Annals of Yorkshire*, vol. i., p. 589.

To face page 504.

PLATE XXVI.



Royal Border Bridge, Berwick.

W. H. Livers, lith.

and North Midland and the Aire and Calder Canal Companies, by which the navigation took the heavy and the railway the light goods, put an end to a long and severe competition detrimental alike to the interests of each. It was, as the chairman of the Railway Company described it, the bringing together of parties who had looked at each other as natural enemies.*

The railway companies had now begun to realise that the fruits of competition were low dividends and duplicated services, and to see the advantage of pursuing a more pacific policy. Conferences were held and proposi-



From "*Illustrated London News*," Aug. 31st, 1850.

CASTLE HOWARD STATION WITH ROYAL TRAIN.

tions launched which eventually resulted in the "Octuple Agreement"†—a great pooling arrangement—among the principal companies interested in the traffic north of York.‡

The opening of the Great Northern Railway from London to Peterborough marked an important stage in the development of the east coast route. The position of the route was still further improved by the opening

* *Herapath's Journal*, 1850, p. 856.

† Minutes of York and North Midland Railway Company, 16th July, 1851, and 20th February, 1852.

‡ *Herapath's Journal*, 1850, p. 1194, and 1851, p. 258.

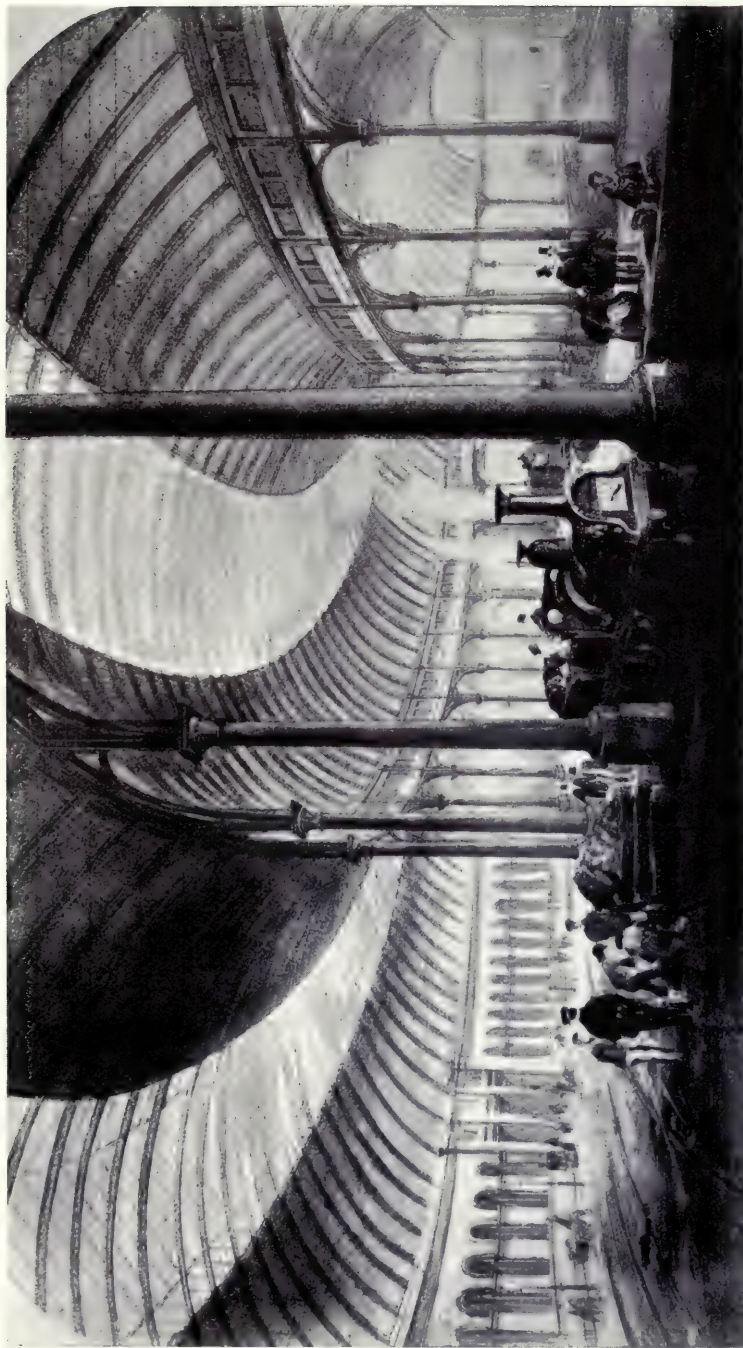
of the Central Station at Newcastle and the viaduct over the Tweed on the 29th of August, 1850,* and, by the opening for passenger traffic on the 1st of October of the Pelaw and Washington branch which, from this time, formed a part of the main line of the York, Newcastle and Berwick Railway. The great station and the great viaduct were both opened by Queen Victoria and Prince Albert, who had begun their journey that day at one of the prettiest roadside stations of the York and North Midland Railway—Castle Howard.

The Newcastle Central Station, built at the joint expense of the York, Newcastle and Berwick and Newcastle and Carlisle Companies, was the finest example of railway architecture in the kingdom. The station, as opened by Queen Victoria and Prince Albert,† lacked the most distinctive exterior feature of John Dobson's magnificent design—the noble classic colonnade which was to have extended the whole length of the building with the massive portico in the centre. The addition of a suite of offices for the accommodation of the staff, whom it was proposed to transfer from York to Newcastle, caused an entire re-arrangement of the design, this being still further modified from motives of economy. Even without the arcades and portico, the stately line of building facing Neville Street, 593½ feet in length, with its simple and appropriate Doric ornament, could not fail to produce a striking effect. Fortunately no alteration of plan was required for the interior of the station, the bold curving lines of which, in building, roof and platform, and the long succession of receding arches, carried on finely-moulded imposts over doors and windows from end to end, give so agreeable an impression of unity and simplicity of design. The site occupied by the station shed—a part of the Spital Field and the grounds known as the Forth—embraced an area of nearly 3 acres; across this site the curved roof was carried in three spans of 60 feet each. The York, Newcastle and Berwick trains began running from the Central Station on the 30th August, 1850, and the Newcastle and Carlisle trains on the 1st January, 1851.

The Royal Border Bridge over the Tweed, the foundation stone of which had been laid on the 15th May, 1847, and the last arch keyed on the 26th March, 1850, was perhaps the largest stone viaduct in the kingdom at this

* The date which is carved above the medallions containing Dunbar's busts of Queen Victoria and Prince Albert is misleading. It is not the date of the opening of the station, but of the formal opening of the High Level Bridge.

† As the manufacturers of Newcastle and others complied, no doubt, with the request of the Mayor that all fires should be extinguished between the hours of eleven and two o'clock in order that the atmosphere might be free from smoke during the royal visit, the Queen and Prince Albert must have seen the town under a peculiarly favourable aspect.



J. Dobson, del.

View of Interior of Central Station, Newcastle-upon-Tyne, 1850.

time. Designed by Robert Stephenson and erected at a cost of £120,000, it consisted of 28 semi-circular arches, each 61 feet 6 inches in span, springing from lofty piers, the total length of the bridge being 2,160 feet, the width between the parapets 24 feet and the greatest height, from the bed of the river to the parapets, 126½ feet. An embankment, ½ mile in length, and, in some places, 60 feet high, connected it with Tweedmouth station.* Though the formal opening of the bridge took place on the 29th August, 1850, goods traffic had been worked across it since the 20th July.†

Among the other railway events of 1850 must be mentioned the opening, on the 12th June, 1850, for mineral traffic, and in August for passenger traffic, of a private line of railway from Bedlington Colliery to Newsham (2¾ miles) by the Bedlington Coal Company—virtually an extension of the Blyth and Tyne Railway—which was carried across the river Blyth by a picturesque timber viaduct 80 feet in height and 770 feet in length designed by Robert Nicholson‡; the opening of the Sunderland Dock by George Hudson on the 20th June, 1850, in which, a few months later, the York, Newcastle and Berwick Company, having disposed of their staiths on the Wear to the Dock Company, began shipping their coals; and the opening of the Alnwick branch (2¾ miles) formally on the 5th August and for public use on the 19th. At the Trafalgar Goods Station, Newcastle, which was opened in 1850, the first application of hydraulic power to railway work was made with the most satisfactory results, this improved system of cramage having been adopted in 1848 on the recommendation of Mr. Allport.§

An event of incalculable importance, commercially, to the North of England was the discovery at Eston, on the 8th June, 1850, of the main seam of the Cleveland ironstone. Preparations having been made for the working of it, Messrs. Bolckow and Vaughan laid down a short branch line from the mines to the Middlesbrough and Redcar Railway, about two miles in length—opened on the 6th January, 1851||—and began sending large quantities of ironstone to the blast furnaces which they had built five years before at Witton Park.¶ This new traffic came as a windfall to the Stockton and Darlington Company who were passing through a period of exceptional

* *Architect*, 7th September, 1850; *Proc. of Inst. Civ. Engineers*, vol. x., p. 220.

† *Architect*, 7th September, 1850.

‡ *Newcastle Journal*, 15th June 1850.

§ *Proc. Inst. Civ. Engineers*, vol. ix., p. 376, vol. l., p. 73, vol. xciv., pp. 77 and 78. On the 20th February, 1888, Mr. T. E. Harrison in a letter to Mr. Allport stated that the cranes had worked admirably at a minimum cost for repairs without alteration since the day they were put up.

|| *Herapath's Journal*, 1851, p. 95.

¶ *Gateshead Observer*, 2nd August, 1851.

difficulty. In leasing the Wear Valley and Middlesbrough and Redcar Railways at 6 per cent., they had saddled themselves with an annual payment for rental of upwards of £47,000, which exceeded by a very large amount the net revenue of their own as well as of the leased lines.* For three years they had managed to pay the rental by drawing upon a special reserve fund representing the profit made on the construction of the Shildon Tunnel, but in 1850 this fund was nearly exhausted and they found themselves unable to meet their obligations—a painful position for a company who, at the time of entering upon the lease, were paying a dividend of 13 per cent. An arrangement was made by which the payment of the full amount of the guaranteed rent was temporarily suspended. The net revenue was to be divided in such a manner that the Stockton and Darlington Company should get a proportion of it equal to one-tenth of the sum received by the Wear Valley and Middlesbrough and Redcar Companies, provided that this sum should represent a clear dividend of 4 per cent. If it did not, then the proprietors of the leased lines were to take the whole of the net revenue and leave the Stockton and Darlington Company without a farthing. In the event of the traffic of the united lines paying 6 per cent. to the lessors and 4 per cent. to the lessees, any balance which might remain was to be applied to the discharge of the arrears of rent.†

The effects of this crisis in the affairs of the once so prosperous Stockton and Darlington Railway Company are briefly noted in his diary by old Edward Pease:—"Shares sold for £30, once deemed worth £300 and estimated in my schedule three or four years ago at £250. The change reduces my personal property about £35,000."‡ The share-capital of the Stockton and Darlington Railway Company at this time was only £200,000, while the bonded debt amounted to £650,000. Of this sum £52,000 had been raised under the provisions of the Acts of 1821 and 1824; £500,000 had been contracted without legal authority, but subsequently authorised by the Act of 1849 (12 and 13 Vic. cap. 54), which re-incorporated the company and vested in them the Middlesbrough dock; the remaining portion of the debt, £98,000, though existing at the time of the Act of 1849, had not been returned for the purpose of being legalised by the Act, the directors intending to liquidate it out of the reserve fund and other assets expected to come in.§ The greater part of the reserve fund, however, having been

* *Heraopath's Journal*, 1850, pp. 1170 and 1175.

† *Ibid.*, 1851, p. 177.

‡ *Diaries of Edward Pease*, 1907, p. 289.

§ *Heraopath's Journal*, 1851, p. 177.



Painted by J. W. Carmichael.

Opening of the Sunderland Dock, June 20, 1850
(One of the last public acts of George Hudson).

T. Picken, lith.

absorbed by the rentals of the leased lines this amount of £98,000 remained unauthorised until 1851 when, with the authorised portion of the debt, it was converted into share-capital under the powers of an Act passed on the 19th May. By capitalising their mortgage debt at 4 per cent., the Stockton and Darlington Company saved about £3,000 a year in interest. The effect of the ironstone traffic on the revenue was soon apparent, and by the end of the year the company were able to resume the payment of the guaranteed rentals and also to discharge the whole of the arrears. In the latter part of 1851 there were only two branch lines from the Middlesbrough and Redcar Railway to the ironstone district—the Eston line of Messrs. Bolekow and Vaughan and the Upleatham line of the Derwent Iron Company. In November appeared the prospectus of a new line, from Middlesbrough to Guisbrough with two branches to the Cleveland Hills, the chief promoters of which were Joseph Pease and his son, the late Sir Joseph Whitwell Pease. The scheme was launched at an unfavourable period of railway enterprise. By those who questioned, like John Vaughan, the commercial value of the ironstone of the Guisbrough district, it was regarded as “almost chimerical.”* The filling up of the subscription list proceeded slowly, and it was not without some difficulty that the Messrs. Pease, who had shrewdly opened negotiations for one of the ironstone royalties at Codhill, got a company formed. Of this company the late Sir David Dale, then barely twenty-two years of age, was appointed the secretary.

The year 1851, in which the first measures were taken by the Stockton and Darlington Railway Company for occupying the rich mineral district of Cleveland witnessed the consolidation of the various dock and railway interests centering at West Hartlepool. For some time previous to 1851 the relations between the Clarence Company and their lessees, the Stockton and Hartlepool Company, had been considerably strained on account of the diversion of traffic for shipment from Port Clarence to West Hartlepool. The possibility of a union with the Stockton and Darlington Company had even suggested itself to a section of the Clarence proprietary, and certain diplomatic communications had passed between one of the leading shareholders and Mr. Joseph Pease, but the Stockton and Darlington Company, realising that a great part of the West Durham traffic would probably be abstracted by the Auckland branch of the York, Newcastle and Berwick Railway and unfavourably impressed by the reports of their engineers on the

* *Parliamentary Evidence on the Stockton and Darlington and Cleveland Railway Bills, 1858,* p. 87.

Clarence line and works, had taken an unusually long time to consider the matter. Mr. Ralph Ward Jackson had then stepped in and secured, on behalf of the Stockton and Hartlepool Railway Company, a perpetual lease of the Clarence Railway from the 1st January, 1851, over the heads of the Stockton and Darlington Company, the conditions of the agreement being that the Stockton and Hartlepool Company should assume all the liabilities of the Clarence Company and pay a dividend of £2 10s. per annum on the ordinary shares, with the option of purchasing them at the end of five years at the rate of £50 per share.* The next object of Mr. Jackson was to unite the Stockton and Hartlepool and Hartlepool West Harbour and Dock Companies. The interests of the two companies were very closely connected, and it was important to secure unity of action in view of the approaching completion of the great railway between Leeds and Stockton. The Dock Company, no less than the Railway Company, had to contend with the Stockton and Darlington competition. This very year the Darlington Company had promoted a bill—subsequently withdrawn—for the construction of a harbour of refuge and docks at Redcar which boded no good to the Hartlepoons. An arrangement was proposed by Mr. Jackson and adopted at meetings of the Railway and Dock Companies held in September, under which the two undertakings were to be united as from the 1st July, 1851, on the principle of a perfect amalgamation of interests.

On the 1st July, 1851, the East and West Yorkshire Junction Railway, which had been worked at first by the York, Newcastle and Berwick Company and subsequently by Messrs. E. B. Wilson & Co., of Leeds, on behalf of the East and West Yorkshire Junction Company, came into the possession of the York and North Midland Company under a working contract for 99 years, the two companies agreeing to amalgamate as soon as an Act could be obtained for the purpose. In consequence of these arrangements, which took effect from the 1st July, 1851, the powers obtained by the Leeds and Thirsk Company for the leasing and purchasing of the Clarence, Stockton and Hartlepool, and East and West Yorkshire Junction lines were never exercised. In South Northumberland the continued menace of a competitive line from the collieries of the Blyth district to North Shields, together with the refusal of the Board of Inland Revenue to concede to a private railway an exemption of duty on passengers conveyed under 1d. per mile as allowed to public companies, led

* *Herapath's Journal*, 1851, p. 26.

the lessees of the various lines forming the Blyth and Tyne Railway to apply for Parliamentary powers of incorporation. During the course of the year they cut through Prospect Hill, of which the promoters of the rival scheme had made so much in 1848, in order to adapt the gradients to locomotive power; they rebuilt the bridges; erected additional spouts on Cowpen Quay; and generally improved the line, bringing the total capital expenditure up to about £130,000.

By the opening, on the 1st June, 1851, of a mile of railway between Sprouston and Mellendean Burn, where it formed a junction with the North British Railway, the York, Newcastle and Berwick Company obtained access to Kelso. The opening of another short line between Starbeck and Knaresborough ($1\frac{3}{4}$ miles) by the Leeds Northern—previous to the 8th August, 1851, the Leeds and Thirsk—Company, and the remaining portion of the East and West Yorkshire Junction Railway (1 mile), including the Nidd viaduct on the 1st October, 1851, completed another route between Harrogate and York. The Newcastle and Carlisle Company took a good stride forward towards the lead-mining district of Alston by the opening of a portion of line between Haltwhistle and Shafthill ($4\frac{1}{4}$ miles) for goods in March, and for passengers on the 19th July, 1851. A further advance was made on the 5th January, 1852, when the line from Lambley to Alston ($8\frac{3}{4}$ miles) was opened for goods and minerals, together with the short line (1 mile) connecting the branch with the Hartleyburn and Brampton Railway at Haltonlee Gate. The construction of the Lambley viaduct delayed the final opening of the branch until the 17th November, 1852. The works on the Alston branch were necessarily heavy, comprising a cutting about a mile long through the manor of Bellister and a number of stone viaducts, three over the South Tyne and the others over the Glendue, Thinhope, Knar, Thornhope, Whitley and Gilderdale burns. Of these the highest as well as the most picturesque and imposing was the Lambley viaduct, which crossed the vale of the South Tyne on nine semi-circular arches of 58 feet span at a height of 110 feet above the surface of the water.* There were gradients on the branch as steep as 1 in 56, 1 in 70, and 1 in 80. The Newcastle and Carlisle Railway Company having abandoned their intention of going to Nenthead, could now regard their undertaking as practically finished, the total length of line open for traffic being $79\frac{1}{4}$ miles. The completion of the works of the Leeds Northern Railway was another notable event of 1852. The formal opening

* *Newcastle Journal*, 13th September, 1851.



From a lithograph published by Day & Son.

WEST HARTLEPOOL DOCKS FROM THE NORTH-WEST, ABOUT 1852.

[In foreground, Waterworks; on left-hand side, the Slake, Middleton and Old Hartlepool; in centre, old Gas-works and Jackson and Coal Docks; on right-hand side, Dock Office, Custom House and Victoria Terrace; between Docks and Waterworks, Mill House.]

of the new portion of the line between Melmerby and Stockton (29 miles) took place on the 15th May, the occasion being celebrated by a trip of the shareholders and their friends from Leeds to Stockton and a procession through the streets of Stockton from the station to the new Town Hall. About two miles of this branch had been constructed by the Northern Counties Union Company as part of their Wath branch and transferred to the Leeds and Thirsk Company under an arrangement authorised by the Leeds and Thirsk Act of 1848. In agreeing to dispose of this portion of line to the Leeds and Thirsk Company for £6,000, the Northern Counties Union Company had retained ample powers to use it in case they should afterwards require to do so, but the Company were already in the throes of dissolution and now this portion of line—the fragment of an unfinished branch—remains the only memorial of a great railway enterprise, the only material result of an expenditure of over £200,000! One of the engineering difficulties overcome in the construction of the new line was the making of a tunnel at an angle of 23 degrees under the York, Newcastle and Berwick Railway near the Willow Beck in the township of Northallerton without interfering with the traffic of that railway. It was accomplished by driving piles into the embankment and constructing a platform upon them to support the rails, then excavating the embankment in sections and immediately walling up the space excavated, finally introducing the arch and removing the piles.* The chief feature of the new line was the great viaduct, 760 yards in length, built in 1849 at a cost of £44,500, over the river Tees and the quaint old town of Yarm. Designed by Thomas Grainger, it consisted of 42 arches, 40 of these having a span of 40 feet each and two, carrying the railway over the river at a height of 65 feet, a span of 67 feet each.† By arrangement with the Leeds Northern Company, the original line of the Stockton and Darlington Railway for 2 miles from Whitley Springs near Egglescliffe to Mount Pleasant near Stockton had been deviated and now ran for the greater part of that distance alongside of the Leeds Northern line.

In view of the increase of traffic anticipated from the extension of the Leeds Northern Railway to Stockton a great scheme of development had been carried out at West Hartlepool, comprising the enlargement of the

* The construction of the tunnel was carried out according to the plan, and under the superintendence of Mr. Joshua T. Naylor, the resident engineer. See Ingledew's *History and Antiquities of Northallerton* 1858, pp. 339-341.

† Gordon's *Watering-places of Cleveland*, 1869, pp. 137-138; *Sunderland News*, 22nd May, 1852.

harbour from 13 to 44 acres, the construction of a merchandise dock of 14 acres having a steamship entrance from the harbour, with a graving dock at the west side of it 320 feet in length. The ceremony of opening this series of works took place on the 1st June, 1852, when a procession of life-boats, steam-tugs and sailing ships entered the new dock—appropriately named the “Jackson” dock, one of them, the *Victoria*, being floated into



THOMAS ELLIOT HARRISON.

the graving dock.* The Act confirming the amalgamation of the dock and combined railway undertakings received the Royal Assent on the 30th June, 1852, though it was not until the 17th May, 1853, that the three companies were actually merged into one under the title of the “West Hartlepool Harbour and Railway Company.”† With the combined companies, the Leeds Northern Company entered into a close alliance, directed against a common enemy—the York, Newcastle and Berwick Company. The struggle,

* *Newcastle Chronicle*, 4th June, 1852.

† *Sunderland Herald*, 20th May, 1853.

so long anticipated, began immediately after the opening of the Leeds Northern line to Stockton. The Leeds Northern Company carried goods from Stockton at a mere nominal rate, carting them to the station for nothing.* The competition for the passenger traffic between Ferryhill and Leeds reached such a point in July, 1852, that the York, Newcastle and Berwick Company conveyed passengers from Leeds to Newcastle and back (*viâ* York), a total distance of 238 miles, for 2s.† As the Leeds Northern Company had announced that the fares by their railway "would not be allowed to exceed those charged by any other line," it was evident what the result of the competition would be—a reduction to an absurdity. The question whether a traffic agreement could not be devised appears to have been discussed for a time, but it was seen that if the larger companies agreed to a mere temporary division of traffic they would be strengthening the hands of the Leeds Northern Company and placing them in a position to extort higher terms when the time came for renewing the agreement. Mr. T. E. Harrison, who was the general manager, as well as the engineer, of the York, Newcastle and Berwick Railway, saw that the only safe and satisfactory solution of the problem was amalgamation, and he submitted this plan to the consideration of his board. How the suggestion was received may be told in his own words: "Upon my recommendation of that course (the making of an arrangement in the shape of an amalgamation) to the company, I stood alone: I was not supported in it at first by any of the directors, but by degrees, when they had investigated the whole circumstances of the case, they one by one came round to my view, and ultimately they were convinced that it was the best course. I had had previous experience of the amalgamation of those companies which formed the York, Newcastle and Berwick. I had watched the results of that, and I was fortified therefore by experience in my recommendation."‡ The York, Newcastle and Berwick Company were in this position that they could not amalgamate with the Leeds Northern Company without also amalgamating with the York and North Midland Company, otherwise they would have held the key to the through traffic of the York and North Midland Company, an arrangement to which that company could not reasonably be expected to assent.

The three boards, having accepted the principle of amalgamation, left

* Evidence of T. E. Harrison, *Railway Times*, 22nd July, 1854, p. 765.

† Latimer's *Local Records*, p. 306.

‡ *Parliamentary Evidence on North Eastern and Newcastle and Carlisle Amalgamation Bill*, 1860, p. 5.

the plan by which the union could be effected to be discovered by their respective managers. It would have been difficult, perhaps, to have found in the whole of England three men more admirably qualified to undertake such a difficult and important task than the representatives of the three companies who met in conference at Newcastle in the latter part of August, 1852. The representative of the York, Newcastle and Berwick Company was Mr. Thomas E. Harrison, not only one of the soundest engineers in the North of England, but a railway manager of such experience and knowledge that when, in 1850, the directors of the York, Newcastle and Berwick Company felt it necessary to have "one master-mind" to superintend the whole of their affairs*—the phrase was Mr. Leeman's—their choice fell inevitably upon Mr. Harrison; the representative of the York and North Midland Company was Mr. Alexander Clunes Sherriff, their goods manager, afterwards general manager of the West Midland Railway, a director of the Metropolitan, Metropolitan District, and a dozen other railways, chairman of the Worcester Porcelain Company and the Oldbury Carriage Company, and for many years M.P. for Worcester;† the representative of the Leeds Northern Company was Mr. Henry Tennant, their accountant and traffic manager, afterwards so long and honourably connected with the North Eastern Railway as accountant, general manager and vice-chairman of the Board of Directors.

After considering several propositions, the three managers decided that the terms of the amalgamation must be based on traffic value. The capitals of the three companies, they proposed, should form the capital of a new corporation, but be kept separate for all purposes of charge and dividends under the designations of the "Berwick Capital Stock," the "York Capital Stock" and the "Leeds Capital Stock." The three debenture debts, they advised, should be consolidated into one, the interest being charged to the amalgamated companies proportionately to the amount placed to their respective capital accounts. They proposed to throw the traffic receipts into a common purse, and after paying all the working expenses, to divide the net proceeds according to the traffic value proportions of the three companies. The most difficult question to decide was what percentage of the net revenue should be apportioned to the Leeds Northern Company: this was the pivot on which the whole of the negotiations turned. It was necessary to calculate the value of the traffic, supposing the competition then in force to be at an end, and to allow for the development of a line, only recently opened, which

* *Herapath's Journal*, 1850, p. 252.

† *Proc. Inst. Civil Engineers*, vol. lii., p. 284.

formed a new channel of communication between the West Riding of Yorkshire and the East Coast. Eventually it was arranged that the Leeds Northern proportion of the net receipts should commence at 7 per cent. and be gradually increased to $9\frac{1}{2}$ per cent. The percentages of the other two companies were subsequently fixed by taking an average of their net receipts for the three years 1850, 1851 and 1852, making, however, certain adjustments in favour of the York and North Midland Company because that company had been too short a time in possession of the East and West Junction line to develop its traffic and, owing to competition, had realised a smaller proportion of profit during the Exhibition year than the York, Newcastle and Berwick Company. A complicated series of questions relating to surplus land and property, shares in other companies, unfinished works, rolling stock, stores, etc., having been settled and the terms of an agreement arranged with the old allies of the Leeds Northern Company, the Stockton and Hartlepool Company, the managers presented their report on the 22nd September to the representatives of the three boards, who passed resolutions approving of the method suggested for effecting the amalgamation and, on the 2nd November, 1852, the scheme for the permanent union of the three companies was submitted to their respective shareholders.*

At only one of the meetings were the terms of the amalgamation rejected. The Leeds Northern shareholders claimed a larger proportion of the net receipts, and after lengthy negotiations the two wealthier companies agreed to concede to them 8 per cent. of the net receipts in the first year, 9 per cent. in the second year and 10 per cent. in the third and subsequent years, preferring to make a slight sacrifice rather than imperil the whole arrangement.† To have prolonged the negotiations would have been hazardous in view of the fact that the Leeds Northern Railway formed the *point d'appui* of at least three menacing schemes: the first, for a branch from the Stockton and Hartlepool Railway near Greatham to Haswell, the second for a railway from the Clarence Railway, near Coxhoe by way of Sherburn House Colliery, Pitlington, Houghton-le-Spring and Herrington to the South Dock, Sunderland, and the third for a "Direct North Railway" from Doncaster to Galashiels, connecting the Great Northern, the Leeds Northern, the North British and the Glasgow and South Western Railway, and forming a link in a new federation of railways between London and Edinburgh. One of

* Minutes of York and North Midland Railway Company, 27th September and 6th, 13th and 20th October, 1852.

† Half-yearly Report, York, Newcastle and Berwick Railway, 8th February, 1853.

the principal supporters of the Sunderland and Leeds Northern Junction Railway,* actuated alike by personal and public considerations, was the ex-Railway King, chairman of the Sunderland Dock Company, whose next effort, it was shrewdly surmised, would have taken the shape of overtures to the London and North Western and Lancashire and Yorkshire Railway Companies.† There is little doubt that, if the Leeds Northern Railway had remained independent, a bold attack would have been directed from Sunderland and West Hartlepool upon the traffic of the York, Newcastle and Berwick Railway. Even as it was, the coal-owners had made a somewhat arbitrary use of one of these schemes to secure an abatement of their dues for a period of 14 years.‡ In making a concession which changed the attitude of the Leeds Northern Company to these hostile schemes while reconciling all sections of that proprietary to the union, the two wealthier companies took a sensible and judicious step. The revised terms were formally accepted by the Leeds Northern shareholders at a meeting held on the 17th of December, 1852, a fitting acknowledgment being made by the Chairman (Thomas Constable) of their indebtedness to Mr. Tennant for having ascertained the correct position of the Company and pointed out the way which led to the meeting of the 2nd of November.§ Application was then made to Parliament for an Act to legalise the amalgamation and, in the meantime, the three companies entered into provisional agreement for the joint working of the traffic from the 1st April, 1853, Mr. Harrison being appointed general manager, and Mr. Sherriff traffic manager, of the associated lines.

Closely connected with two of the united companies, the Malton and Driffield Junction Railway Company recognised that they might be affected by the amalgamation. A large number of their shares were held by one of the companies, and they themselves were principally interested in the Thirsk and Malton branch of another, for, a mandamus having been obtained in 1851 for the construction of the branch, so long delayed, they had engaged to subscribe £35,000 towards one moiety of the cost of it, the York, Newcastle and Berwick Company contributing the other moiety. Early in 1853 they made overtures for incorporation in any union of the companies which might be legalised, and, in March, it was arranged that this company also should be admitted into the great

* *Railway Times*, 9th October, 1852.

† *Ibid.*, 27th November, 1852.

‡ *Parliamentary Evidence on Newcastle and Carlisle Amalgamation Bill*, 1860, p. 131; *Railway Times*, 13th November, 1852, p. 1190.

§ *Railway Times*, 15th January, 1853.

North Eastern confederacy. The Hull and Selby Company now became unduly alarmed about the performance of the contract of the 30th June, 1845, for the lease in perpetuity of their line to the York and North Midland Company either solely or jointly with the Lancashire and Yorkshire Company, and they intimated that they would oppose the dissolution of the York and North Midland Company, as contemplated in the Bill for amalgamation, until the completion of the lease by that company. As the question of the liability of the Lancashire and Yorkshire Company to become joint lessees was not definitely settled at this time, the York and North Midland Company considered the action of the Hull and Selby Company unreasonable and vexatious, more especially as they had already pledged themselves to carry out, in good faith, the terms of the agreement.

Another cause of disquietude was the dispute between the ordinary and preference shareholders of the Leeds Northern Company with regard to the division of that company's proportion of the net revenue. In order that all sections of the Leeds Northern proprietary might have an interest in assenting to the scheme of amalgamation, it was proposed to make what was termed "an equitable adjustment of interests." The plan suggested was to reduce the dividends payable on the several classes of preference shares from 6 and 5 per cent. to 5 and 4 per cent. until the original shares should receive a dividend of $2\frac{1}{2}$ per cent. and, after this point had been reached, to divide any surplus net revenue rateably among all classes of proprietors; meanwhile capitalising the arrears of preference dividends and paying them by the issue of additional 4 per cent. preference stock. But the preference shareholders stood out against this mode of adjustment, asserting their legal right to the full amount of the dividends guaranteed, with the arrears accruing, before any distribution of profits took place among the ordinary shareholders. The York Companies in their agreement with the Leeds Northern Company had insisted upon these differences being composed in order that the conflict of interests might not imperil the great measure of amalgamation. Application was made to Parliament to sanction the reference of the matters in dispute to Mr. George Carr Glynn and Mr. Robert Stephenson, but the Committee appointed to consider the Leeds Northern Bill expunged from it the clauses relating to arbitration, and the danger arising from the Leeds Northern dissensions had once more to be faced.

Owing to the "Cardwell resolutions" of 1853 the Amalgamation Bill was withdrawn, but the interim traffic arrangement remained in force, supplemented by a traffic arrangement with the Malton and Driffield Junction

Company, and under these agreements the various lines continued to be worked. One by one the various works in course of construction, when the question of amalgamation was first raised, had been opened for traffic—the Penshaw branch ($6\frac{1}{2}$ miles) on the 20th December, 1852, for minerals, on the 4th April, 1853, for goods, and on the 1st June, 1853, for passengers; the Thirsk and Malton branch ($22\frac{1}{2}$ miles) and the Malton and Driffield Junction Railway (19 miles) formally on the 19th May, 1853, and for public traffic on the 1st June, 1853; the Victoria Dock branch, Hull ($3\frac{1}{4}$ miles), on the 16th May, 1853, for goods and on the 1st June, 1853, for passengers. With the exception of a tunnel on the Malton and Driffield Junction Railway at Burdale, 1,734 yards in length, a cutting through the limestone rock at Claxheugh near Sunderland of 80,000 cubic yards, a large oblique bridge, with skew-span of 58 feet, crossing the Durham road at Sunderland at an angle of 32 degrees and a small iron bridge at Penshaw,* these branches added little of engineering interest to the North Eastern Railway.

Casting a glance over the district between the Tweed and the Humber we notice several signs of a revival of railway activity. In the session of 1852 two new companies were incorporated, viz. :—

Name of Railway.	ACT.		Length of Line	Capital intended to be raised in Shares and by Loans.
	Description.	Date of Royal Assent.		
Middlesbrough and Guisbrough*	15 & 16 Vic. cap. 73	17th June, 1852	Miles. 12	£ 96,000
Blyth and Tyne†	„ „ 122	30th June, 1852	13	150,000
			25	246,000

Having obtained their Act, the directors of the Middlesbrough and Guisbrough Railway found some difficulty in setting the project fairly afloat. It seemed at one time as if they would not be able to raise a sufficient amount of capital to make the line. At this critical juncture Mr. Joseph Pease and his son came forward and guaranteed a dividend at the rate of 4 per cent. for the first year, $4\frac{1}{2}$ the second, 5 the third, 5 the fourth, and 6 the fifth and subsequent years.‡ The effect of the offer was immediately to

* *Sunderland Herald*, 3rd June, 1853.

† First directors : David Baker, William Randolph Innes Hopkins, Henry Pease, George Reade, William Thompson, Robert Walker, and Isaac Wilson. First chairman : Henry Pease.

‡ First directors : Charles Carr, George Carr, John Carr, William Carr, Ralph Park Philipson. First chairman : John Carr.

§ *Darlington and Stockton Times*, 30th October, 1852.

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PLATE XXIX.



Photo by

Bedlington Viaduct.

M. W. Ramsey.

stimulate the demand for shares and, on the 30th October, 1852, Mr. Pease had the satisfaction of cutting the first sod. On the 11th November, 1853, the railway ($9\frac{1}{2}$ miles in length, with a gradient of 1 in 44 for 3 miles) was opened for minerals, and on the 25th February, 1854, for passengers, being worked by the Stockton and Darlington Company. Only one of the branches was made—that to Codhill (1 mile), which rose from the junction to the ironstone mines at inclinations of 1 in 54, 1 in 27, and 1 in 19.

The Blyth and Tyne Company found themselves committed to a policy of extension even before the line came into their hands, on the 1st January, 1853. A rival company having resuscitated the scheme of 1848 for a dock at the Low Lights, North Shields, now proposed to make a railway, under Parliamentary authority, from Morpeth direct to North Shields with branches to Ashington and Seaton Sluice. In self-defence the Blyth and Tyne Company deposited plans for lines occupying part of the same ground. The Parliamentary struggle which ensued was a severe one. The promoters of the Tynemouth Docks and Morpeth and Shields Direct Railway chiefly directed their attack against the old system of wayleaves which pressed so heavily on the lessees of the collieries north of the Blyth. The Blyth and Tyne Company were in the position of having to unite with the landowners in fighting for a system which had already driven the Netherton coals away from their line to the York, Newcastle and Berwick and West Cramlington lines. Their reward was a concession by the landowners of modified terms of wayleave, which diminished the evils of the system but did not remove them. "It was only by the landowners granting a lease for so long a period as 1,000 years and by reducing the terms to the extent of about 33 per cent.," wrote Mr. Robert Nicholson, the company's engineer, in October, 1853, "that Parliament was induced to perpetuate the principle and allow the owners to retain their wayleave."* Opposed by the Blyth and Tyne Company and the landowners on the one hand, and by the River Tyne Commissioners, who had just let the contract for a dock of their own at Howdon, on the other, the promoters of the Dock and Railway scheme failed to establish their case and their Bill was thrown out by a committee of the House of Commons. The powers applied for by the Blyth and Tyne Company were obtained on the 4th August, 1853. These enabled them to construct a branch from Newsham to Morpeth and part of a branch to Tynemouth from New Hartley to the Dairy House near Seaton Delaval,

* Cowpen Papers, vol. 4, Mining Institute, Newcastle.

the intention, however, of the company being to purchase certain existing private lines and continue one of them to Morpeth. They were pledged to the landowners to complete the railway to Tynemouth and, the following year, obtained power to make this extension, as well as a branch from Bedlington to Longhirst, thus effectually safeguarding the district from invasion.*

Attempts were made in 1852 and 1853 to open up the rich agricultural and pastoral districts of Northumberland, railways being projected from Acklington to Rothbury and from Morpeth to Maxwellhaugh by Rothbury, Whittingham and Wooler,† but they came to nothing. In north-east Durham the opening of new collieries by the Marquis of Londonderry had made it necessary either to enlarge Seaham Harbour or to form a railway to Sunderland Docks, which offered such great facilities for the shipment of coals. The Marquis, who had already, on the 14th September, 1852, begun sending a portion of his coals to the docks by means of a connection between his Rainton and Seaham line and the old Durham and Sunderland line at Seaton Bank top,‡ decided in favour of the railway and, on the 8th February, 1853, the first sod of this railway, now a part of the North Eastern Railway system, was cut by his lordship near Seaham.§ In Yorkshire a railway from Southcoates, Hull, where it joined the Victoria Dock branch of the York and North Midland Railway by way of Hedon and Patrington to Withernsea and a railway from Bedale to Leyburn in the same direction as the original line of the Northern Counties Railway, were projected in 1852 and sanctioned by Parliament in 1853, viz. :—

Name of Railway.	ACT.		Length of Line.	Capital intended to be raised in Shares and by Loans.
	Description.	Date of Royal Assent.		
Hull and Holderness|| ...	17 Vic. cap. 93	8th July, 1853	Miles. 18 $\frac{3}{4}$	£ 153,000
Bedale and Leyburn¶ ...	,, ,, 137	4th Aug., 1853	11 $\frac{3}{4}$	66,000
			30 $\frac{1}{2}$	219,000

* Half-yearly Report, 27th February, 1854.

† *Newcastle Chronicle*, 5th November, 1852, and 3rd June, 1853.

‡ *Newcastle Chronicle*, 17th September, 1852. § *Sunderland Herald*, 11th February, 1853.

|| Directors appointed by the Act: Anthony Bannister, Henry Cautley, John C. M. Harrison, John G. B. T. Hildyard, Arthur Marshall, Joseph Walker Pease, Samuel Priestman, Christopher Leake Ringrose. First chairman: Anthony Bannister.

¶ Directors appointed by the Act: Ralph Stapylton Dobson, John Hammond, Thomas Kirkby, Christopher Other, The Hon. Amias Charles Orde Poulett, James Pulleine, Frederick Riddell, Henry Van Straubenzee, Marmaduke Wyvill. First chairman: Marmaduke Wyvill.

Power was granted to the Hull and Holderness Company to become joint owners with the York and North Midland Company of a station to be erected at the Victoria Dock and of that part of the Victoria Dock branch lying between this station and the junction of the two lines,* also to the York, Newcastle and Berwick Company to subscribe £5,000 towards the Bedale and Leyburn Company, the sum required for the completion of the line between Leeming Lane and Bedale, the construction of an additional half mile of railway and the erection of a joint station at Bedale.† Both railways were intended to be worked by the North Eastern Railway Company. In south-west Durham the old scheme of connecting Barnard Castle by railway with the outer world was revived in 1852. There was no possibility of the Northern Counties Union Company making their line between Barnard Castle and Hagger Leases Lane—the liability of the company to pay £35,000 over and above the value of the land to the Duke of Cleveland as the price of his assent to their Bill had been the main cause of the failure of the undertaking‡—and the promoters of the railway therefore fixed upon a route which would interfere as little as possible with the ducal estates, viz., by way of Newsham, Winston, Alwent, Gainford and Piercebridge. A prospectus was issued in November, 1852, and a company formed, several of the provisional directors being members of the Stockton and Darlington Board.

The Bill introduced into Parliament by the promoters of this railway met with fierce opposition. It was attacked, not only on the ground that the line would cut up the property of the landowners and cross a number of public roads in a dangerous manner, but that it would give to the Stockton and Darlington Company an unfair monopoly of the traffic of the district. Ultimately a technical objection was raised with regard to the width of the formation-base of the proposed railway, which was 15 feet. A base of this width, Mr. Robert Stephenson declared to be quite safe, provided the ballast were good. That reservation sealed the fate of the Bill, and the Committee refused to pass it.§ A further survey of the district was afterwards made, and in November, 1853, the promoters of the scheme renewed their application to Parliament. At the same time the Stockton and Darlington Company, whose coal traffic from the Gaunless Valley had so greatly increased since

* Minutes of York and North Midland Railway Company, 2nd February and 15th June, 1853.

† *Herapath's Journal*, 1853, p. 685.

‡ *History of the Darlington and Barnard Castle Railway*, 1877, pp. 32-34.

§ *Ibid.*, pp. 54-58.

the establishment of blast furnaces at Middlesbrough, decided to form a branch line from St. Helen's Auckland to the north end of the Shildon Tunnel and abandon the Brusselton inclines. The ever watchful opponents of the Stockton and Darlington Company, whose stronghold was now West Hartlepool, seeing an opportunity of frustrating the plans of their rivals, projected, in opposition to the Darlington and Barnard Castle line, a line from Barnard Castle to Bishop Auckland. A point urged in favour of this line was that, when a railway connection should be made between Barnard Castle and Tebay, it would form part of a direct communication between Sunderland on the east and Liverpool on the west coast. On the other hand it was objected that the line would have the effect of injuring the ports of the Tees by diverting traffic to the ports of the Tyne and the Wear. Naturally, the York, Newcastle and Berwick Company, who had just let the contract for their Auckland branch, and the Sunderland Dock Company were deeply interested in the project which was further supported by petitions from Durham, Newcastle, Sunderland, and West Hartlepool. Once more the Stockton and Darlington Company found themselves involved in a Parliamentary struggle with the West Hartlepool Company. Much of the opposition to the Darlington and Barnard Castle and Tunnel Branch Bills took the form of a personal attack upon Mr. Joseph Pease, whose aim, according to the West Hartlepool evidence, was to control, autocratically, the entire district! After a contest of ten days, the Barnard Castle and Bishop Auckland Bill was rejected. The other two Bills went forward. When the clauses in the Tunnel Branch Bill came before the committee, Mr. Ralph Ward Jackson, who had given evidence to show how grievously the West Hartlepool traffic had been obstructed by the tunnel toll, scored a great success by getting this objectionable charge reduced from 6d. to 2d. The Bills soon after passed into law.*

Two schemes for railways in the Cleveland ironstone district, projected in 1853, came before Parliament in the session of 1854, one, the Stockton and Cleveland Union Railway, a line from South Stockton to Stokesley, with two branches—was thrown out in committee of the House of Commons on the 8th May, 1854; the other, the North Yorkshire and Cleveland Railway, a line from Picton to Grosmont, supported equally by the West Hartlepool and the Leeds Northern Companies, who were authorised to subscribe to the company—was sanctioned by Parliament. Two new companies were thus incorporated on the very eve of the great amalgamation, viz. :—

* *History of the Darlington and Barnard Castle Railway, 1877*, pp. 81-88.



Name of Railway.	ACT.		Length of Line.	Capital intended to be raised in Shares and by Loans.
	Description.	Date of Royal Assent.		
Darlington and Barnard Castle.*	17 & 18 Vic. cap. 115	4th July, 1854	Miles. 15½	£ 133,300
North Yorkshire and Cleveland.†	„ „ „	10th July, 1854	29¾	240,000
			45½	373,000

Meanwhile, Hull had been connected with Withernsea by the opening on the 24th of June, 1854, of the Hull and Holderness Railway (17½ m.), and the Londonderry, Seaham and Sunderland Railway (6 m.)—partially opened on the 17th of January, 1854,‡—was on the point of completion.

In the session of 1854, Parliament had once more before it the question of the union of the York, Newcastle and Berwick, York and North Midland and Leeds Northern Companies. The suspension of the Bill for a year had been more favourable than otherwise to the three companies. It had enabled them, by working the traffic jointly under the agreement of the 31st March, 1853, to show the beneficial effects of the arrangement. These, from the public point of view, were: an improved train service, better accommodation, the advantage of sending goods and minerals at long-distance rates, and a greater facility in obtaining through rates. The general outcry raised at first against the agreement had entirely ceased, and there was substantially no opposition from the public when the Amalgamation Bill came before the committee.§ A petition from the Sunderland Corporation on a special point led to the insertion of a clause making the lighting of third-class carriages compulsory, and that clause was the only trace in the Bill of public solicitude in connection with the amalgamation. “No measure of equal magnitude,” observed the directors afterwards, “was ever carried with so little attendant drawback.”|| It received the Royal Assent on the 31st July, 1854.

* Directors appointed by the Act: John Harcastle Bowman, John Buckton, Isaac Cape Cust, John Dickonson Holmes, Alfred Kitching, Owen Longstaff, Thomas MacNay, Joshua Coke Monkhouse, Henry Pease, Robert Thompson, Rev. Thomas Witham. First chairman, Rev. Thomas Witham.

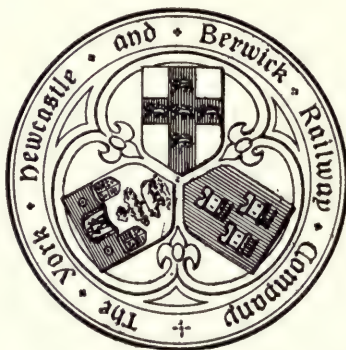
† Directors appointed by the Act: Charles Barrett, Alfred William Bean, Newman Cash, James Kitson, Ralph Ward Jackson, Thomas Jackson, Charles Gascoigne Maclea, John Slater Pratt, Thomas Tredwell, Cuthbert Wigham. First chairman: Lord De Lisle and Dudley.

‡ *Sunderland Herald*, 20th January, 1854.

§ *Parliamentary Evidence on Newcastle and Carlisle Amalgamation Bill*, 1860, p. 6.

|| Half-yearly Report, 29th August, 1854.

Under the powers of this Act the York and North Midland and Leeds Northern Companies were dissolved and their undertakings vested in the York, Newcastle and Berwick Company, who now assumed the comprehensive title of the North Eastern Railway Company. Provision was also made for the amalgamation of the Malton and Driffield Junction Company with the North Eastern Railway Company within three months of the passing of the Act. There were clauses in the Act for the protection of the Hull and Selby Company who, unreasonably nervous about the execution of the lease, had commenced a suit in Chancery against the York and North Midland Company in the earlier part of the year. The undertakings united by the Act comprised 720 miles of railway, of which 17 were in course of construction—a greater extent of mileage than that possessed by any other railway company in the kingdom—and, in addition, about 26 miles of waterway and 44 acres of dock-space. With the exception of three or four miles, the whole of the lines open for traffic had been constructed within 20 years and represented the work of 20 distinct companies, yet the opinion of the Committee of the House of Commons was that “if the whole system were now proposed for the first time, it would have a decided preference over any schemes for the separate portions promoted as distinct undertakings.” No less than 68 acts were recited in the Amalgamation Act and the combined capitals amounted to 23 millions. Stretching—a well regulated monopoly—through that rich mineral and agricultural part of England from which it derives its name, the North Eastern Railway, in 1854, presented one of the most remarkable examples of the process of amalgamation.



SEAL OF YORK, NEWCASTLE AND BERWICK RAILWAY.

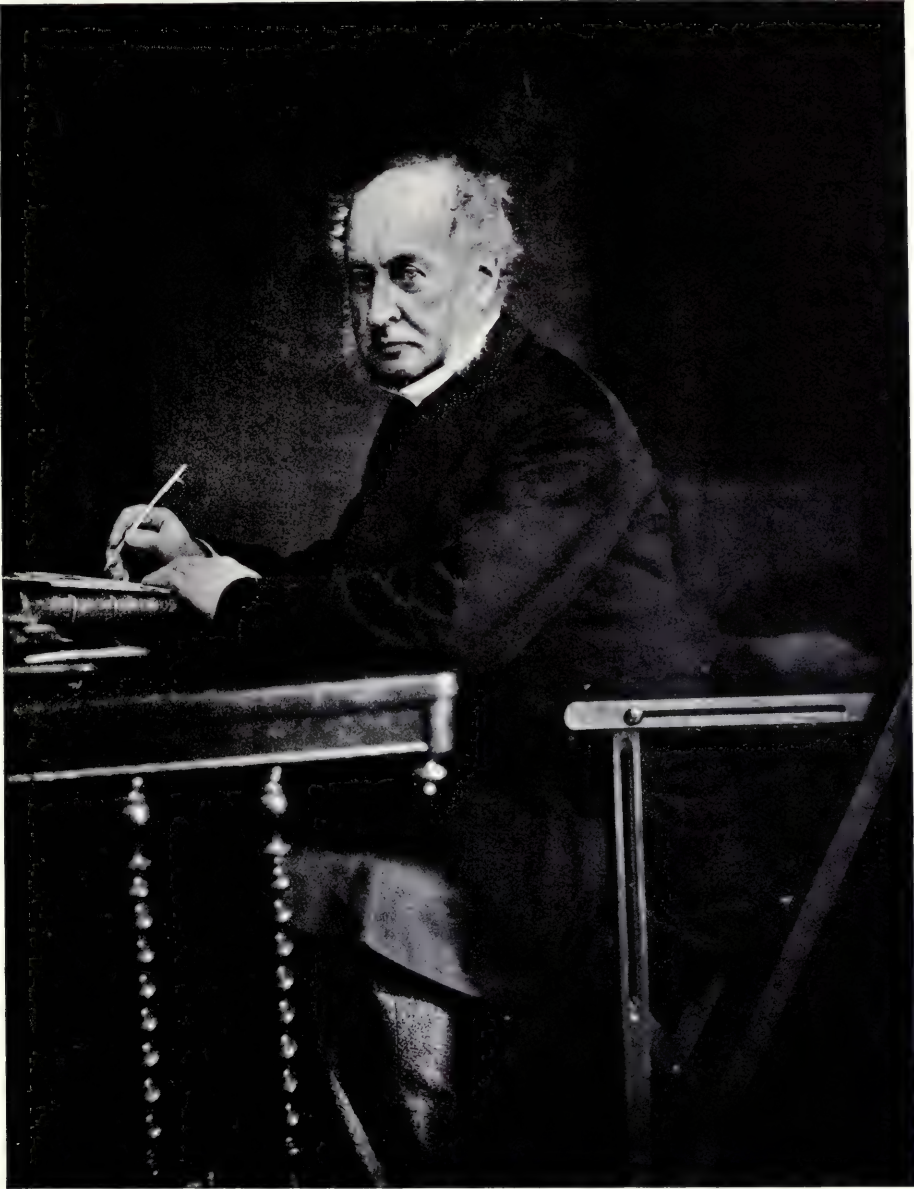


Photo by

O. G. Rijlander.

James Pulleine—Chairman, 1854-1855.

CHAPTER XV.

AT THE BEGINNING OF A NEW RAILWAY ERA.
1854-1857.

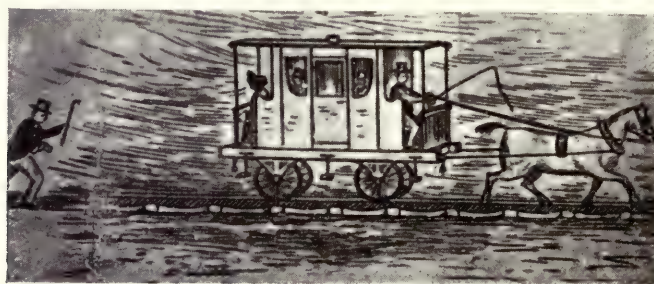
The promoters of the Amalgamation Bill had had to contend against a recommendation contained in the report of a powerful Standing Parliamentary Committee, presided over by Mr. Cardwell, which favoured working arrangements between railway companies rather than amalgamations. The difficulty presented by this recommendation had, however, been overcome, and the Bill obtained, after the admission of clauses by which large powers were given to the Board of Trade, and in which a special reference was made to the provisions of the "Railway and Canal Traffic Act" passed the same session. The North Eastern Railway Company had now to show that amalgamation did not produce the evils anticipated.

At a point so historically interesting as the union of the three great companies whose course we have traced in the preceding pages, let us pause to inquire what was the state of railway progress in the North of England in 1854. In 1854 one was still, so to speak, within hailing distance of the days of the sedan-chair and the stage-coach. Only seven years had elapsed since the last stage-coach from Edinburgh had passed through Newcastle on its way to the railway station at Gateshead, and hardly that number of years since, from the steps of her old house in Clavering Place, Newcastle, Lady Hawks might have been seen entering the sedan-chair in which she was accustomed to be carried to St. Nicholas' Church. Strings of mules and donkeys, laden with coals and lead and even merchandise, might still have been encountered in some of the outlying dales of Durham and Yorkshire, the tinkling of the bell attached to the raker's, or leading animal's, neck announcing their approach.

A great deal of traffic was still worked by horses on some of the earlier lines in the North of England. A contemporary account of a run among the Auckland Collieries gives a vivid description of the mode in which the Hagger Leases Branch of the Stockton and Darlington Railway was worked at this time:—

"The drivers of these 'dandies' deserve a word for the agility they display in taking the sidings. They leap off their seat in front and by

running to the siding and turning it in an instant with a 'switch' they are ready to jump on again when the dandy comes up, the horse in the meantime not in the least slackening his pace. They also discard such useless appendages as reins and control the horse to admiration by shouting at the top of their voices. We had not proceeded far before we were cautioned to be on the look out for the 'Lambs,' who, we were told, were coming to meet us. Not being at all apprehensive of any danger from such a cause, we thought the caution quite needless. It did not take long to be convinced of the contrary. The 'Lambs,' we soon discovered, were a large proprietary who contract for the conveyance of the minerals from the collieries down the incline to Brusselton Bankfoot. It was to avoid being pounced upon by



From "Railway Magazine," 1910, p. 414, by permission.

THE "DANDY" COACH.

one of these self-impelled trains as they came round the numerous curves that we had been cautioned. These waggons can be stopped by a brake which is fixed to each, but it takes a little time to do so, and as the line is here anything but straight we had to be very careful how we proceeded. While waiting on one occasion in a siding for these 'Lambs' to pass, a train of 18 or 20 trucks and waggons swept past. These consisted chiefly of coal and coke waggons, but one or two which brought up the rear were filled with general merchandise and passengers. . . The three last were devoted to the accommodation of the horses which had hauled the empty waggons up and which seemed to enjoy the ride down amazingly. . . With slight interruptions from the 'Lambs,' who were signalled to our drivers by the men who were at work at the mouths of the pits on the left side of the valley and who by their elevated position would command an extensive view of the road, we pursued our way."*

* *Darlington and Stockton Times*, Sept. 9th, 1854.

There were still a few horse-coaches plying regularly on some of the old lines in the North Eastern district in 1854, one, belonging to the West Hartlepool Harbour and Railway Company, between Billingham and Port Clarence; another, belonging to a local coach proprietor, between Middlesbrough and Stockton on a Sunday, the Stockton and Darlington Company running no trains, except mail trains on that day; a third, the "Dandy," belonging to Mr. James Thompson, of Kirkhouse, between Milton and Brampton. The Sunday coach between Middlesbrough and Stockton, if not from 1854, at any rate from the end of 1855 down to 1864, was a railway carriage of four compartments, those at the ends being second-class and those in the middle first-class. A market train from Byers Green to Stockton, which was run by the West Hartlepool Harbour and Railway Company for the convenience of the coal-miners of the district, was drawn by horse-power from Ferryhill to Byers Green. On the journey from Byers Green to Ferryhill the carriages, one of which was always an open one, ran by gravity, the horse after starting the train jumping into a dandy-cart and riding behind.* Passengers were still conveyed up and down the steep inclines on the Stockton and Darlington line between Shildon and St. Helens Auckland, and Crook and Cold Rowley, and on the North Eastern line between Sunderland and Hartlepool, Sunderland and Shincliffe, Ferryhill and Hartlepool, and Goathland and Grosmont, by means of stationary engines and gravity.

Preparations were, however, being made for the abandonment of some of these rope inclines and the adaptation of others to locomotive engines. A trip by the Wear and Derwent branch of the Stockton and Darlington Railway over the elevated tract of moorland lying between Crook and Cold Rowley may have been attended with a certain amount of discomfort, but it was by no means lacking in railway interest. Two composite carriages, fitted up with outside hand brakes, sufficed for the passenger traffic between Crook and Cold Rowley. They were attached to a number of mineral waggons and drawn up Sunnyside incline ($1\frac{3}{4}$ miles) by a stationary engine. From the top of the incline the mixed train was hauled by a locomotive engine at a speed limited to 15 miles an hour to Waskerley Park Junction, the line being a single one with one siding or passing-place on an average to every 1,500 yards. The carriages were then detached and let down Nanny Mayor's incline ($\frac{3}{4}$ mile), running loose behind two or three loaded waggons. At the foot of the incline they were attached to a mineral train

* *History of Spennymoor*, by James J. Dodd, 1897, pp. 157-8.

and drawn by a locomotive engine to Cold Rowley. For the return journey the regulations provided that not more than two waggons were to accompany the coaches in going up the Waskerley incline and that in descending the Sunnyside incline the coaches were to run loose behind the train. According to the statement of one of the old guards the practice was to brake the coaches down this incline, without using the rope, right through to the old station at Crook, which was near to Thistle Flat Colliery.* There were no signals between Crook and Cold Rowley and no pointsmen. When it was necessary to enter a siding the fireman had to jump off the engine and attend to the switches. No van was provided for the guard, who not infrequently, at week-ends, when the carriages happened to be very full, rode outside on the buffer.

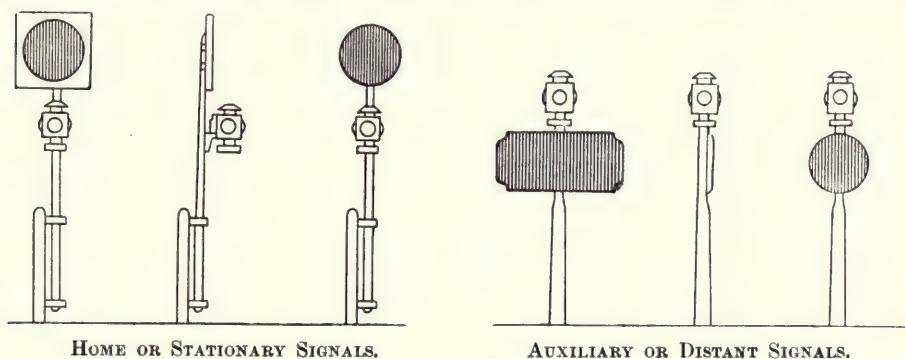
A few years previous to 1854 the question of the renewal of the permanent way had been forced upon railway engineers by the introduction of heavier locomotive engines travelling at higher speeds. At least three accidents may be attributed to the insufficiency of the original permanent way to bear the weight of the later engines—20 tons and upwards: one on the Newcastle and Carlisle Railway near Haltwhistle on the 3rd of August, 1851; the second on the York, Newcastle and Berwick Railway at the west end of Willington Dene Bridge on the 2nd of March, 1853; and the third on the York and North Midland Railway at Hambleton, near Selby, on the 5th of May, 1853, to which a special interest attaches on account of the verdict of manslaughter brought in by the coroner's jury against three of the directors of the Company—the chairman, deputy-chairman, and Mr. Samuel Priestman. At the time of the accident on the Newcastle and Carlisle Railway the line was laid in patches with rails of 42 lbs., 52 lbs., 60 lbs., 64 lbs., 75 lbs., and 82 lbs. to the yard, supported partly on cross-sleepers and partly on stone blocks. As the drivers of the heavy engines sometimes ran them at a high speed when endeavouring to make up lost time, the earlier rails were often found to have been so much bent and distorted that the principal work of the platelayers consisted in straightening them.† By 1853 the rails of 42 lbs. and 52 lbs. to the yard had disappeared from the line. The old stone blocks of the original permanent way having been found to remain firmly fixed in their beds uninjured by time or use‡ were, however, retained, with the object of saving the expense of future renewal.

* Thomas Cheeseman's notes.

† *Reports on Railways*, 1851, p. 103.

‡ Report of the Directors of the Newcastle and Carlisle Railway Company, H.Y.E., June 30th, 1850.

In 1851 a part of the old Leeds and Selby line was reported to be in a very dilapidated state, the metals in most cases used up, many of the blocks in pieces, pins loose, rails insecurely fastened—so much so that a weight at one end raised the other end three or four inches, old-fashioned slide-bars instead of self-acting points, switches which required to be moved by the insertion of a man's hand between them and the rail.* The rails with which two-thirds of the North Eastern Railway had been laid between 1842 and 1847 weighed 65 lbs. to the yard. Hardly had the last rails of this weight been laid between Newcastle and Berwick than the 60 lb. rails of the Great North of England Railway between York and Darlington were replaced by rails weighing $82\frac{1}{2}$ lbs. to the yard, and, at the same time, wooden sleepers were substituted for the stone blocks which had originally been used. In 1847



about $10\frac{1}{2}$ miles of the main line of the York and North Midland Railway were relaid with rails of a new type weighing 80 lbs. to the yard, which presented a convex surface to the wheels.† The rails of the Leeds Northern section weighed 86 lbs. and 75 lbs. to the yard. The Board of the provisionally united Companies appear to have thought at first that a weight of 75 lbs. to the yard would form a sufficiently strong permanent way, but in June, 1853, they adopted a standard weight of 80 lbs. for their rails. Wooden seating for saving the wear of the rails and making the motion of the train easier, fish-plates for securing the ends of the rails, and the straight iron spikes for fastening the chairs to the sleepers had already been introduced previous to 1854. George Hopper's twisted spikes and David Duncan's self-acting points were just coming into use in 1854, patents for both these improvements having been taken out this year.

* Report on the state of the York and North Midland Railway, 1851.

† *The Builder*, 1847, p. 604.

The working of most of the lines of the North Eastern Railway in 1854 was controlled by signals of the old type, so inconveniently low that they could be seen only at a short distance. Even on the main line between York and Normanton semaphore signals had not come into use in 1851. What the disadvantages of the old disc or square signals were we learn from a report of the traffic managers of the line:—"We will suppose," they say, "that two trains, one up and one down, are due at a certain station about the same time. The station master has occasion to stop the up train, but has no business with the down one. Instead of being able to signal the up train to stop and the down train to proceed, his red or danger signal, when turned on, stops both lines and he or his porter has to cross the rails and wave a white signal in order to show the advancing down train that the line is clear. Not only was the person who crossed the line in face of an advancing train exposed to danger, but the up train was unnecessarily delayed."* Similar signals on the Newcastle and Carlisle Railway were declared to be indirectly a source of danger. As they could not be seen from a distance, the greatest precautions had to be taken by the engine drivers when approaching them. Time was thus lost which they endeavoured to make up by increased speed.† The semaphore signals, which cost from £16 to £20 each, were being introduced on some of the lines of the North Eastern Railway in 1852. One of these had been put up at the junction of the old Clarence line and the Leeds Northern line near Norton, and brought into use, but the pointsman, whose duty it was to attend to the signals as well as the switches, found some difficulty in understanding the semaphore system and fell back upon the old disc signals that were still left standing.‡ It is possible that if the higher semaphore signal had been exhibited on the 21st of July, 1852, the unfortunate collision at Norton Junction, in which Mr. Grainger, the engineer, was fatally injured, might have been prevented.

The working of the lines in the north of England in 1854 was greatly facilitated by the electric telegraph, which had been laid down on the lines of the York and North Midland, York and Newcastle, and Newcastle and Berwick Railways in 1846 and 1847, and on the Leeds Northern Railway in 1852 and the Newcastle and Carlisle Railway in 1852 and 1853. The little Middlesbrough and Guisbrough Railway (a single line) had the benefit of the electric telegraph from the very day of the opening, the principle of the block system being employed in the working of its traffic. "No

* Report on the state of the York and North Midland Railway, 1851.

† *Reports on Railways*, 1851, p. 108.

‡ *Railway Times*, 1852, pp. 757.

passenger train," the Government inspector was informed, "will be allowed to leave any of the stations on this Company's line until a telegraphic message is received from the next station reporting the line to be clear."* On the older lines the telegraph was for some time only partially used, on account of the difficulty in getting the staff at the minor stations to learn how to work it. Only one of the station-masters between York and Milford Junction was able to work the telegraph in 1851, and one of the complaints against the station-master of Washington in 1852 was that he "had not learnt to work the telegraph, or at all events paid no attention to it."†

In 1854 we should have looked in vain for many of the locomotive engines described in a previous chapter. Where a familiar name caught the eye, it was more than probable that the distinguishing features of the original engine had been lost in the process of remodelling. It was still possible in 1854 to see some of Stephenson's old engines at work on the Killingworth and Springwell waggonways—one of these being "Billy," which now occupies a place of honour in the Central Station, Newcastle-upon-Tyne. Hedley's engines were also at work on the Wylam waggonway. The locomotive engines in the possession of the North Eastern, Stockton and Darlington, Newcastle and Carlisle, West Hartlepool and Blyth and Tyne Railway Companies in 1854 numbered about 550. They represented a great variety of types and were divisible into five classes, viz.:—Local mineral engines, through mineral and goods engines, local passenger engines, through passenger engines and branch and pilot engines.

Let us glance at a few of the later types. At the close of 1841 Stephenson's six-wheeled long-boiler engines with the three axles between the fire-box and the smoke-box had just been introduced. Owing to the driving wheels of these engines being between the fore and hind carrying wheels under the middle of the boiler, the cylinders were thrown forward outside of the smoke-box. The effect of the overhanging masses at the ends of the engines was to produce unsteadiness at speeds of 45 and 50 miles per hour. In a second design (1845) the driving wheels were placed behind both pairs of carrying wheels immediately in front of the fire-box, by an alteration which admitted of the removal of the cylinders to a position between the carrying wheels. The most famous engine of this type was the "A," which during the narrow-gauge experiments of the 31st of December, 1845, took a train of 50 tons from York to

* Appendix to *Reports on Railways*, 1854, p. 66.

† Y. N. & B. Minutes, Nov. 4, 1852.

Darlington at an average speed of 48 miles an hour.* On the 20th of January, 1846, when travelling from Darlington to York with a passenger train of 40 tons, it attained at times a speed of 60 miles an hour.† This engine, which weighed 23 tons, had outside cylinders 15 inches in diameter with a stroke of 24 inches, driving-wheels 6 feet 7 inches in diameter, boiler 13 feet 6 inches in length, with 139 tubes which, with the area of the fire-box, gave a total heating surface of 939 square feet.‡ Stephenson's plan of placing the three axles of the six-wheeled long-boiler engines between the fire-box and the smoke-box was adopted by William Bouch in 1846 for a new type of mineral engine of which the "Commerce," built at Shildon for the Stockton and Darlington Railway Company, was the earliest example. The "Commerce" was a large engine, weighing 26 tons, with



From "The Engineer," 26th Dec. 1879.

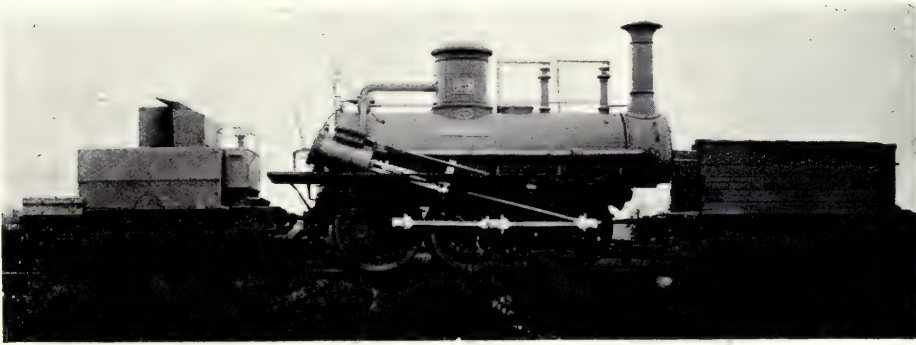
THE "COMMERCE" ENGINE.

outside cylinders 16 inches in diameter having a stroke of 24 inches. The length of the boiler barrel was 13 feet 9 $\frac{3}{4}$ inches and the total heating surface 826 square feet. The most striking features of this engine were the "spectacle" connecting-rods. The reason for making the connecting-rods of this peculiar shape was to enable them to be coupled on the inner ends of the crank-pins of the driving-wheels without interfering with the working of the crank-pins of the leading wheels.§ A powerful type of six-coupled goods engine designed by John Gray and chiefly remarkable for its characteristic valve gear is illustrated by the "Hercules," which was built by Messrs. Shepherd and Todd of Leeds for the Hull and Selby Railway Company (see page 458). It had inside cylinders 16 inches in diameter with a stroke of 20 inches and a total heating surface of 681 square feet.||

* *Herapath's Journal*, 1846, p. 50.

† Robert Stephenson's reply to General Pasley. *Mechanics Magazine*, vol. 44, p. 101.

‡ Dimensions of A engine (maker's number, 493) kindly supplied by Sir W. B. Peat from records of Messrs. R. Stephenson & Co., Ltd. § *The Engineer*, 1879, p. 461. || *Ibid.*, 1880, p. 42.

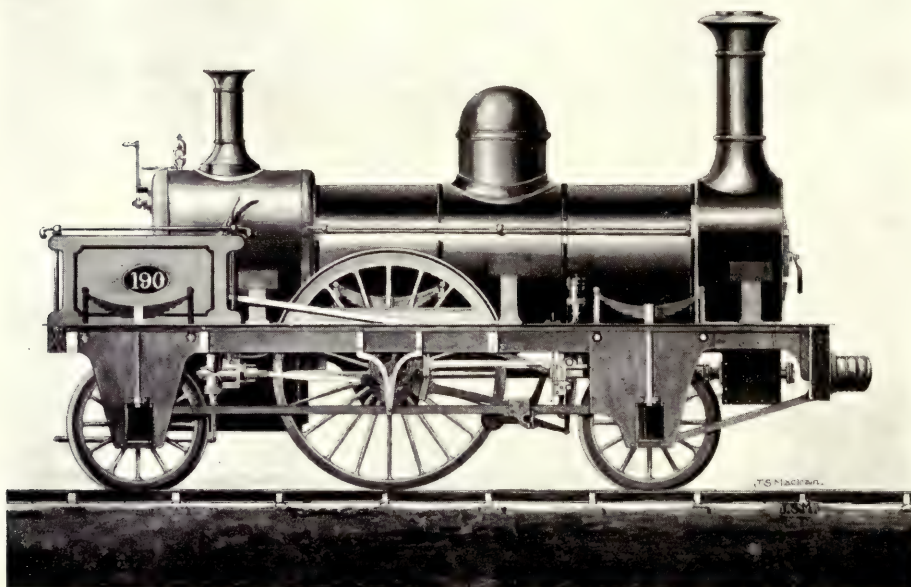


THE "DERWENT" ENGINE.



THE "JENNY LIND" ENGINE.

The "Derwent," built by Mr. Alfred Kitching in 1845 and now preserved as a railway relic in Darlington Station near "Locomotion," represents a type of six-coupled mineral engine much used by the Stockton and Darlington Railway Company. The engine, as built, was of the following dimensions:—Cylinders, outside, $14\frac{1}{2}$ inches diameter; stroke, at an angle of 18° , 24 inches; boiler, length 14 feet, diameter 4 feet 4 inches, with return flue 2 feet 3 inches diameter, fired from the chimney end; wheels, six-coupled, 4 feet in diameter; wheel base, 9 feet, and it weighed in



YORK, NEWCASTLE AND BERWICK ENGINE, NO. 190.

working order, about 22 tons. Among the 371 engines possessed by the North Eastern Railway Company at the end of June, 1854, few worked more efficiently and economically than those of the "Jenny Lind" type, which Messrs. E. B. Wilson & Company, of Leeds, introduced in 1846. Ten of these engines were supplied in 1847 and 1848 to the order of the York and North Midland Company; five at £2,400 each and five at £2,500. Very handsome as well as efficient were these engines with their fluted domes and safety-valve covers, their paddlebox splashers and polished mahogany lagging secured by bright brass hoops. Their principal dimensions were:—Driving wheels, 6 feet diameter; cylinders (inside), 15 inches

diameter, 20 inches stroke; boiler, 15 feet long, 3 feet 8 inches diameter, with 124 tubes; total heating surface, 780 square feet; weight, in working trim, 24 tons. Another Leeds type was well represented in the locomotive stock of the North Eastern Railway by the finely modelled engines of Messrs. Kitson, Hewitson and Thompson, supplied to the Leeds and Thirsk Railway Company in 1847 to work heavy passenger and moderate goods traffic. They had six wheels, four with a diameter of 6 feet and two with a diameter of $4\frac{1}{2}$ feet. The larger wheels were coupled. The cylinders were 16 inches in diameter with a stroke of 22 inches: the boiler had 147 tubes, each 10 feet $10\frac{1}{8}$ inches in length. The total weight in working order was about 26 tons.* Typical examples of the more powerful passenger engines of the North Eastern Railway were Nos. 77, 180 and 190, all of which had single driving wheels placed just in front of the fire-box. The first was Stephenson's patent 3-cylindere engine, designed with the object of securing greater stability, two of the cylinders being outside and one inside; the second (tried on December 28, 1848) was R. & W. Hawthorn's patent first-class passenger engine the "Plews"; the third (delivered January 24, 1849) was one of Stephenson's improved express engines, which differed from the other engines in having the valve-chests outside the cylinders and the eccentrics outside the driving wheels. No. 77 and No. 190 were the engines which usually drew the royal trains between York and Berwick, when Queen Victoria travelled over the East Coast route.† It was No. 190 which, bringing the royal train from York to Newcastle on the 29th of August, 1850, opened the Central Station.

From the following particulars it will be seen that these engines differed but little from each other in size and power:—

	No. 77.‡		No. 180.§	No. 190.||
	Inside.	Outside.	Inside.	Inside.
Cylinders—diameter ...	16 $\frac{3}{8}$ in.	10 $\frac{1}{2}$ in.	16 in.	16 in.
stroke ...	18 in.	22 in.	20 in.	20 in.
Driving wheels—diameter ...	6 feet 8 in.		7 feet	6 feet 7 in.
Carrying wheels—diameter ...	3 feet 9 in.		4 feet	3 feet 10 in.
Boiler barrel—length ..	11 feet		10 feet 8 in.	11 feet
Brass Tubes—number ..	170		229	174

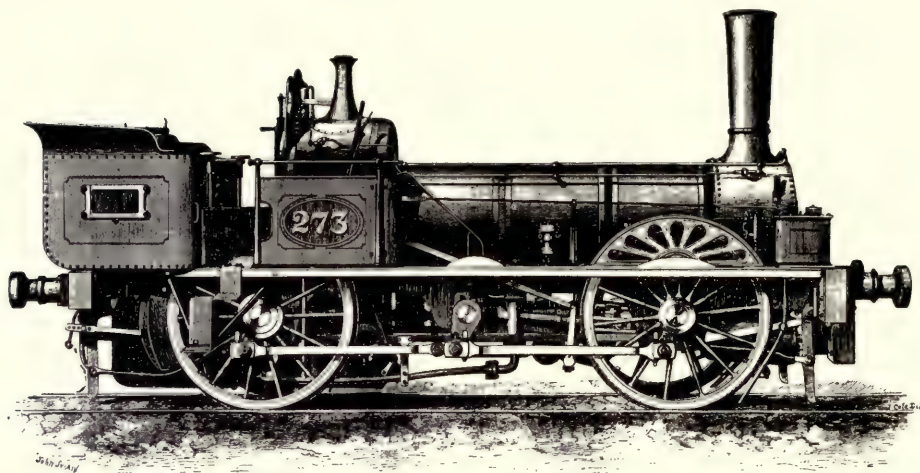
* D. K. Clark, *Railway Machinery*, vol. i. p. 202.

† Both engines were highly ornamented, No. 77 having, in front of the smoke box, a piece of fine carved work representing St. George and the Dragon, and above the carving a crown on a cushion of crimson silk velvet, No. 190 having also a crown on a similar cushion with bullion fringe. *Newcastle Council Reports*, vol. 15, Record p. xxxi.

‡ D. K. Clark, *Railway Machinery*, vol. i., pp. 211-12.

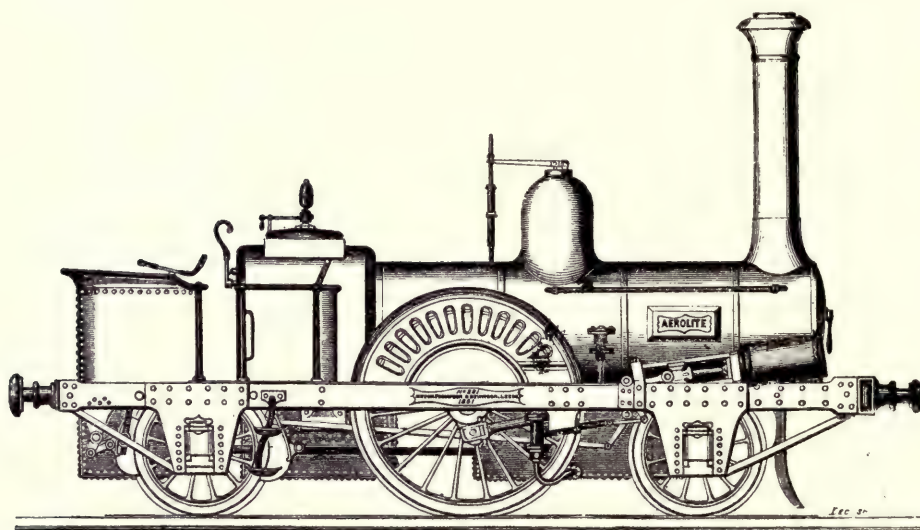
§ Tredgold on the Steam Engine, Division A., Ninth Paper.

|| D. K. Clark, *Railway Machinery*, vol i., pp. 206-7.



From "The Engineer," Jan 30th, 1880.

TANK ENGINE No. 273.



Kitson, Thompson, and Hewitson's Locomotive Tank Engine.

From Exhibition Catalogue, 1851.

THE "AEROLITE" ENGINE.

The total weight in working order of No. 77 was 27 tons, of No. 180 27 tons, and of No. 190 22 tons. The total heating surface of No. 190 was 1,046 square feet. With an express train of three or four carriages, the coke consumed by this engine, including that used in the getting up of steam, was 18 lbs. per mile.* No. 180 was even more economical in the consumption of fuel. On the 11th of October, 1850, No. 77 took the royal train from Berwick to Newcastle at an average speed (excluding a stoppage of 5 minutes) of 57 miles per hour. No. 190 took the train from Newcastle to York at an average speed (assuming the stoppage at Darlington to have been 5 minutes) of 51 miles per hour.

In the North Eastern locomotive stock were some interesting types of tank engines. One of these was No. 273, designed by Mr. W. E. Carrett and built by Messrs. E. B. Wilson & Company in 1850. It had four wheels only, but these were coupled to an intermediate crank-shaft, to which motion was transmitted in the usual way. The diameter of the wheels was 5 feet, and the wheel base was 10 feet 11 inches. The cylinders were 11 inches in diameter, with a stroke of 18 inches. The total heating surface was 576 square feet. The tank held 225 gallons of water and the quantity of coke carried was 1 ton.† A tank engine of another type, purchased by the Leeds Northern Railway Company in 1852, was the "Aerolite" which had gained distinction at the Great Exhibition of 1851, a medal being awarded to the makers, Messrs. Kitson, Thompson & Hewitson, of Leeds, for the excellence of the workmanship displayed in the engine. The "Aerolite" ran on six wheels, the driving wheels having a diameter of 6 feet, the carrying wheels a diameter of 3 feet 6 inches. The cylinders were 11 inches in diameter, with a stroke of 22 inches. Constructed to draw light express trains, the engine was capable of carrying 500 gallons of water in the tanks and a sufficient supply of coke for a journey of 50 miles.‡ In 1853 and 1854 Messrs E. B. Wilson & Company, of Leeds, were building for the North Eastern Railway Company a number of engines of the "Jenny Lind" type but on a larger scale, costing £2,800 each. Two of the engines (Nos. 215 and 218), having 6½ feet driving wheels and cylinders 17 inches by 22 inches, were the largest possessed by the Company at the time of the Amalgamation.

The accommodation provided for passengers was somewhat better than in 1841. Wider carriages were used, the width of some of the later ones

* *Trans. Inst. Mechan. Engineers*, April 25th, 1849, p. 9.

† *The Engineer*, Jan. 30, 1880, p. 77.

‡ *Catalogue of the Great Exhibition of 1851* vol. i., p. 236.

being 7 feet 6 inches. A good example of the rolling stock of the period is the renovated composite carriage preserved in the Carriage Shops at York. It was built by Messrs. Horner & Wilkinson, of Darlington, at a cost of £230, for the Stockton and Darlington Railway in 1846, and consists of three compartments (one first and two second class), with guard's seat on the top and outside brake. The second class carriages were closed at the sides in 1854 and most of the third class carriages covered. One is surprised to



STOCKTON AND DARLINGTON COMPOSITE COACH [1846].

learn that open third class carriages were used at all on the North Eastern Railway in 1854. As a matter of fact, 30 of the 239 third-class carriages owned by the North Eastern Railway Company at the time of the Amalgamation were uncovered. These open "tubs" had been regularly in use on the Newcastle and South Shields and Newcastle and Sunderland lines between 1845 and 1852,* but in 1854 were only found attached to market trains and other special trains which carried passengers at less than the

* *Newcastle Courant*, Nov. 19, 1852.

Parliamentary rate of 1d. per mile. On the 7th of October, 1854, a pitman, travelling in one of these open carriages between Newcastle and Darlington, was struck near Pelaw, at a point where the space between the two lines of rails was unusually narrow, by the door handle of the van of the "down" express and so severely injured that he died soon afterwards. The attention of the directors was thus drawn to this very unsafe and uncomfortable mode of travelling, and on the 22nd of December, 1854, they decided to discontinue the use of open carriages.*

The guards' vans were of two kinds, one known as the York van, a familiar type still used, the other of a more primitive type. The following is a description of one of these vans which left Darlington on the 8th of December, 1848, attached to a fast train:—"The van consists of a platformed framing on springs of the same height as the framing of the other carriages of the train, the platform being partially covered in so as to make a box for luggage; the rest is open to the weather, but with sides about 4 feet high, and a seat in one corner for the guard, who is free to move about in his box, and has the power, by leaning over, to look along the sides of the carriage and view the train. He is placed so low that he cannot, without standing on his seat, see the roof of the second carriage from him."†

The bulk of the North Eastern mineral traffic in 1854 was still conveyed in chaldron waggons. The need for waggons of larger capacity had been felt before 1845 when the Great North of England Company began using six-ton waggons for long distances.‡ Eight-ton coal waggons were just coming into use in 1854. The number of chaldron waggons possessed by the North Eastern Company at the time of the Amalgamation was 10,050, of six-ton waggons 2,743, and of eight-ton waggons 3.

While the locomotive stock of 1854 contained the most powerful and efficient types of engines known at the time there was a singular absence of novelty of design in the carrying stock, and this is perhaps the more remarkable seeing that, as early as 1838, corridor carriages from 50 to 60 feet in length supported on bogies and heated by stoves, had been running in America,§ that sleeping cars with double doors at each end, and patent

* Traffic Committee Minutes, Oct. 12. 1854, and Locomotive, etc., Committee Minutes, Dec. 22, 1854.

† *Reports on Railways*, 1848, pt. ii., p. 75.

‡ *Gauge Evidence*, Qn. 6253, p. 153.

§ *Civil Engineering of North America*, by David Stevenson, 1838, p. 264.



DEARNESS VIADUCT, BISHOP AUCKLAND BRANCH.

ventilators were actually being built to run between New York and Boston,* that "smoking divan" carriages had been running on the Eastern Counties (now Great Eastern) Railway since 1846,† that eight-wheeled carriages 40 feet in length were running on the South Eastern Railway,‡ that the idea of "travelling restaurants" or corridor trains with a bill of fare in each compartment and a bell within reach of the passenger's hand for communicating with the waiter in the "refectory," had been introduced to the notice of railway men as early as 1846.§ Some of the earlier lines connected with the North Eastern Railway retained in 1854 the peculiarities which had previously distinguished them. The locomotive engines of the Newcastle and Carlisle and West Hartlepool Harbour and Railway Companies still observed a different rule of the road from those of all the other companies in the United Kingdom, running on the right-hand side, instead of the left. The Newcastle and Carlisle Company still adhered to the old stage-coach plan of providing the guards with way-bills on which the booking-clerk at every station entered the number of tickets issued to passengers travelling by the train.|| Under the old-fashioned head of "road-money," the guard was required to enter the amount of excess fares collected or fares received from passengers without tickets. The term "travelling engines" was still occasionally used in 1854 on the Stockton and Darlington Railway as the equivalent of "locomotive engines."¶ Luggage was still carried on the tops of the carriages and, as most of the station platforms were exceedingly low, the work of taking the luggage up and down was a fruitful cause of delay. The luggage was not always securely strapped and then the guards were tempted, in contravention of one of their regulations, to pass over the tops of the carriages when in motion to the great risk of life or limb. Oil lamps, that so often burnt feebly and fitfully, were still used for lighting the carriages. Yet, even before 1854, the electric light had displayed its illuminating power in the Central Station, Newcastle,** and, in 1854, was being tried in a part of King's Cross Station, London. Waiting-rooms were

* *Darlington and Stockton Times*, July 1st, 1854.

† *Illustrated London News*, Sep. 12th, 1846 (two woodcuts of these carriages).

‡ *Report on Railways*, 1849, p. p. 152-6.

§ *Builder*, April 4th, 1846.

|| *Minutes of Evidence on North Eastern and Newcastle and Carlisle Railway Amalgamation Bill*, 1860, p. 8.

¶ *Inspector's Reports*.

** The electric light was exhibited on the 25th June, 1850, by Mr. W. E. Staite, who subsequently submitted to the directors of the York Newcastle and Berwick Company a tender for lighting the station.

PASSENGER TRAIN SERVICE ON THE NORTH EASTERN RAILWAY IN 1854
AND ON A FEW OTHER LINES SINCE UNITED WITH IT.

	No. of Miles.	No. of Trains per Day. (Monday-Friday.)	No. of Trains per Day with Accommodation for 3rd-class Passengers.	Average Speed per Hour of Trains.		Fares.			
				Express or Mail.	Slow.	1st.	2nd.	3rd.	Gov.
MAIN LINE.				each way	each way	s. d.	s. d.	s. d.	s. d.
Normanton-York	24½	8	3	31-37	20-22	6 0	4 6	3 0	2 0½
York-Newcastle	81½	a8 b7	2	39	22	20 0	14 6	9 6	7 0
Newcastle-Berwick	67	7	a2 b3	41	23	15 6	11 2	7 3	5 6½
BRANCH LINES.									
Alnwick Branch	3	4	a2 b3	—	20	0 8	0 6	0 4	0 3
Bedale	5¾	6	3	—	18	1 6	1 0	0 8	0 6
Boroughbridge	6	5	3	—	19-20	0 11	0 10	—	0 6
Ferryhill and Hartlepool	16½	4	4	—	18	—	—	—	—
Hull and Scarborough	53¾	4	4	—	21-22	11 6	8 6	6 6	4 5½
Hull and Selby	30¾	7	3	31	25-27	5 6	4 6	3 0	2 6½
Kelso Branch	22½	3	2	—	24	4 6	3 10	2 6	0 11
Leeds and Milford Old Junc'n	13½	3	3	—	18-22	3 0	1 9	—	1 1¼
Leeds and Stockton	61	a4 b5	2	—	21-26	—	—	—	—
Malton and Driffield	20	3	1	—	23	4 0	3 0	—	1 8
Newcastle and Tynemouth	8¾	16	15	30	15-16	1 0	0 9	0 6	—
Newcastle and Monkwearm'th	11¾	12	12	—	15	1 8	1 3	—	1 0
Newcastle and South Shields	10	12	12	—	15	0 9	0 6	0 4	—
Richmond Branch	10	4	2	—	20-30	2 0	1 8	—	0 10
Selby and Market Weighton	17½	2	2	—	18-20	—	—	—	—
Sunderland and Hartlepool—									
Hendon and Haswell	9	3	3	—	12	4 0	3 0	—	1 9
Haswell and Hartlepool	12½	3	3	—	18-20				
Sunderland and Penshaw	6½	7	2	—	17-19	—	—	—	—
Sunderland and Shincliffe	14½	4	4	—	14	—	—	—	—
Thirsk and Malton	30	3	1	—	23	7 6	5 0	—	2 6
York and Harrogate (via Knaresbro')	18½	4	a2 b1	—	21-23	4 6	3 2	—	1 7
York and Harrogate (via Church Fenton)	29½	3	3	—	23-25	4 6	3 6	2 6	2 5
York and Market Weighton	22½	3	3	—	20-24	4 0	3 0	2 6	1 10½
York and Scarborough	42¾	5	2	32	24-28	10 0	7 0	5 0	3 6½
York and Whitby	56¾	3	2	—	21-22	10 6	7 6	6 0	4 8½
OTHER RAILWAYS.									
Blyth and Tyne—									
Blyth to Percy Main	11¼	a3 b4	3	—	16	1 3	—	0 9	—
Bedlington to Percy Main	12¾								
Hull and Holderness	18	4	—	—	25	3 0	2 6	1 9	1 6
Middlesbrough and Guisbrough	9¾	3	—	—	14-18	—	—	—	—
Newcastle and Carlisle—									
Main Line	59½	5	a3 b2	—	20-23	12 0	9 6	6 3	—
Alston Branch	13	2	2	—	16	2 9	2 0	1 5	—
Stockton and Darlington—									
Darlington to Redcar	23	a 6b5	1	—	20-24	4 0	3 0	2 0	—
Darlington to Frosterley	24½	3	—	—	19-22	4 6	3 4	2 3	—
Crook to Cold Rowley	13½	2	—	—	15	2 0	1 0	—	—
West Hartlepool Harbour and Railway—									
West Hartlepool to Stockton	11	6	a4 b3	—	19	—	—	—	—
Stockton to Ferryhill	12¾	3	a1 b2	—	19-22	—	—	—	—

N.B.—a up trains; b down trains.

necessarily much frequented in 1854. The clergyman who characterised certain North Eastern trains of the twentieth century as "painfully punctual" would have had a different cause for complaint in 1854. A Government inquiry into the extent and nature of irregularities in the conveyance of mails revealed the fact that the night mail was invariably late in arriving at Newcastle. From June, 1853, to March, 1854, it was over 40 minutes late per day on an average. In the month of December, 1853 (exclusive of one day on which a heavy fall of snow caused more than ordinary obstruction), the difference between the booked and the actual time of arrival averaged 69 minutes per day, varying from 20 minutes to 2 hours and 14 minutes. That a proportion of the delay occurred on the North Eastern Railway may fairly be taken for granted.

The travelling facilities afforded by the North Eastern Railway in 1854 were on a very different scale from those provided at the present day. The foregoing table will show at a glance the number and average speed of the trains which ran in each direction daily on the principal lines, together with the fares charged for a single journey by the ordinary trains.

The lines with the best train service were those between Newcastle and Tynemouth, Newcastle and South Shields, and Newcastle and Sunderland which had as many as 16 and 12 trains a day in each direction. Eight trains a day in each direction, it will be seen, sufficed for the needs of the travelling public on the main line, from five to seven on a few of the branch lines and from three to four on all the remaining branch lines. The number of trains which left the busiest station on the system—the Central Station, Newcastle, every week-day except Saturday was 49, viz.:—7 to Berwick, 8 to York, with an additional train to Durham, 16 to Tynemouth, 12 to South Shields and Sunderland, 5 to Carlisle. On Saturday 12 extra market trains left Newcastle for Darlington, Derwenthaugh and Blaydon, and two additional trains for Tynemouth. Forty-seven trains entered the station on five days of the week and 60 on Saturdays. On Sundays 35 trains entered and 37 trains left the station.

A relatively high speed was attained on the North Eastern Railway in 1854. From 37 to 41 miles an hour may be taken as the average speed of the express trains and from 20 to 23 miles an hour that of the slow trains. The express and Parliamentary trains of the North Eastern Railway travelled faster than any similar trains in the kingdom except, perhaps, those of the Great Western Railway Company. The mail train from York to Newcastle

was proved before a Parliamentary Committee to be the fastest in England.* The Parliamentary train from Newcastle to London left Newcastle at 5 a.m. and arrived at York at 10 a.m. It then went by way of Burton Salmon and Knottingley to Doncaster, and followed the present Great Northern line past Peterborough to London where it arrived at 4 p.m.

The fares charged were generally somewhat high. On the main line they were based on a rate per mile of 2·48d. first class, 2·07d. second class, 1·35d. third class. On the branches the rate varied. On the Tynemouth line it was exceedingly low—1·37d. first class and 1·00d. second class. The fares on the Hull and Selby branch were also based on a low rate—2·14d. first class, 1·75d. second class and 1·17d. third class. On the other branches we find variations from 2·40d. to 3·00d. first class, 1·75d. to 2d. second class and 1·0d. to 1·48d. third class. An extra charge was made for travelling by an express train. The fares by the ordinary trains from York to Newcastle were 20s. first class and 14s. 6d. second class. By the express trains they were respectively 23s. 6d. and 17s.

Special facilities were more numerous in 1854 than might have been expected. Return tickets were issued daily between certain stations to first and second class passengers at a fare and a half. They were issued at the rate of a fare and a sixth during the summer months between Kelso and Tweedmouth, not only to first and second class, but also to third class passengers. Week-end tickets, available for return on the Sunday night or Monday morning, were issued by certain trains to passengers of all classes, except the fourth or Parliamentary class, at the rate of a fare and a sixth. Third class passengers, however, were not allowed, like the first and second class passengers, to return on a Sunday night by the night mail trains. On Sundays, by certain trains between Newcastle and Monkwearmouth, even cheaper return tickets were issued to first and second class passengers, the price of these tickets being 1s. 9d. first class and 1s. 4d. second class or 1d. more than the ordinary single fares. On market days return tickets were issued from the intermediate to the principal stations at the rate of a fare and a sixth. On the Hull and Holderness line the rate for market tickets was a fare and a third. Return tickets at 3d. each were issued by a market train running on Saturday evenings between the mining village of Eston and Middlesbrough, a distance of 5 miles. It should, however, be mentioned that Messrs. Bolckow & Vaughan allowed the use of their branch (2 miles)

* Chairman's speech, Aug. 29th, 1854. *Railway Times*, 1854, p. 955.

free of charge.* Pleasure parties of ten and upwards desiring to visit any particular place on the North Eastern system might have these "day tickets" at the rate of a fare and a sixth by making application to the passenger superintendents.

Special facilities were offered during the summer months for travelling from the principal towns to well-known watering-places. First and second-class tickets at less than a single fare, available for return within a fortnight, were issued from Newcastle, Sunderland, South Shields, Durham and Hartlepool and from Darlington, Richmond, Bedale, Northallerton, Stock-



From "*The Illustrated Times*," Jan. 3rd, 1867.

BRIDGE OVER THE WEAR AT BRASSIDE (BISHOP AUCKLAND BRANCH).

ton, Ripon and Thirsk to Scarborough, Bridlington, Filey and Whitby. For an additional half-a-crown, tickets could be obtained available for return within twenty-eight days. Family tickets were also issued from the same towns to the same watering-places enabling families of four to travel at even a cheaper rate. Tickets at less than the ordinary single fare, viz., 5s. first class, 3s. 6d. second class and 2s. 6d. third class were issued to Warkworth "by the trains leaving on Wednesdays at 5.45 and 7.30 a.m., and 1.30 p.m.; and on Sundays at 7.35 a.m., available for return by

* *Darlington and Stockton Times*, 1st, May 1852.

trains leaving Warkworth on Wednesdays at 6.57 p.m., and on Sundays at 7.1 p.m.” First and second class tickets available for return within a fortnight were issued from Leeds and Normanton to Edinburgh and other places on the North British main line and Hawick branch, as well as to places on the Kelso branch at the rate of a fare and a sixth. While all the railway companies of the United Kingdom were under a statutory obligation to provide one train a day travelling at a speed of not less than twelve miles an hour and stopping at every station for the conveyance of third class passengers paying a penny a mile, the North Eastern Company, under the provisions of the “Great North of England Purchase Act, 1846,” were bound to run every week day, except Christmas Day and Good Friday, two cheap trains each way, not only on the main line between York and Newcastle, but on all the branches connected with it constructed previous to the date of the Act, and these trains were required to travel at not less than twenty miles an hour.

The total revenue of the North Eastern Railway Company for the half-year ending June 30th, 1854, was £741,801 16s. 0d., viz. :—

	£	s.	d.	Per Cent.
Passenger Traffic	221,870	17	11	= 30
Mineral Traffic	237,285	12	0	= 32
Goods Traffic	212,957	0	1	= 29
Cattle Traffic	22,581	17	4	= 3
Parcels Mails, etc.	41,152	8	10	= 5
Miscellaneous Receipts	5,953	19	10	= 1
	<u>£741,801</u>	<u>16</u>	<u>0</u>	

The working expenses amounted to £334,119 9s. 7d., equal to 45 per cent. of the gross receipts, and the total expenditure was £371,551 2s. 5d. Nearly three million passengers were carried during the half-year in the ordinary trains, of whom 66 per cent. travelled third class, 25 per cent. second class, and 9 per cent. first class.

Having now taken a general view of the North Eastern Railway as it was in 1854, let us proceed to trace its development from the time of the Amalgamation. The first event which we have to record was the opening throughout of one of the present lines of the North Eastern Railway—the Londonderry, Seaham and Sunderland Railway—upwards of 6 miles in length, constructed at an estimated cost of upwards of £50,000. The opening ceremony took place on the 3rd of August, 1854, when a mineral

To face page 548.

PLATE XXXII.



G. B. Black, 1861.

Captain O'Brien—General Manager, 1854-1871.

train of 22 waggons, loaded with South Hetton coals, passed over the line, followed by a passenger train of 12 carriages, the coals being afterwards shipped in Sunderland Dock in the presence of Earl Vane and George Hudson, M.P., the chairman of the Dock Company. The chief engineering features of the new line were three large timber viaducts: the Dalton viaduct, 320 feet long and 64 feet high; the Seaham Hall viaduct, 200 feet long and 85 feet high; and the Ryhope Dene viaduct, 400 feet long and 85 feet high.* At the first general meeting of the shareholders of the North Eastern Railway Company, which was held on the 29th of August, 1854, it was announced that the Malton and Driffeld Junction Railway Company had decided to become a party to the Amalgamation, the terms of the agreement being that their proportion of the joint earnings was to be based on the traffic value of the line at the end of five years. They were to have one director on the North Eastern Board to represent their interests. In accordance with this arrangement, the first Board of Directors was constituted as follows: elected by the York, Newcastle and Berwick shareholders, 8; by the York and North Midland shareholders, 5; by the Leeds Northern shareholders, 3; by the Malton and Driffeld Junction shareholders, 1; total number of directors, 17.† Soon after this meeting Mr. T. E. Harrison, who had acted as general manager to the united companies since the commencement of the joint working, asked to be released from these duties, and, on the 26th of October, Captain William O'Brien, who had acted as secretary during the same period, was appointed general manager as well as secretary. Two days later the amalgamation of the Malton and Driffeld Junction Company with the North Eastern Company took effect.

At this time there were two vexatious matters which marred the general harmony, one was the Hull and Selby Chancery suit against the North Eastern Railway Company, the other the dispute between the preference and ordinary shareholders of the Leeds Northern section. Pending the Chancery suit, the directors, not unwilling, perhaps, to cause inconvenience to the Hull and Selby shareholders, had paid into Court, on the 11th of August, the half-year's rent due to them. The latter presented a petition to recover the rent with interest from the 2nd of August, which was granted

* *Sunderland Herald*, Aug. 4th, 1854.

† Newman Cash, William Charles Copperthwaite, George Dodsworth, James Hodgson, William Rutherford Hunter, James Kitson, James Leechman, George Leeman, Duncan McLaren, Charles Gascoigne Maclea, Nathaniel Plews, Samuel Priestman, James Pulleine, George Hicks Seymour, Harry Stephen Thompson, William Lloyd Wharton, Robert Williamson. First chairman: James Pulleine.



NORTH ENTRANCE OF BRAMHOPE TUNNEL.

by the Vice-Chancellor. An agreement having been concluded with the Lancashire and Yorkshire Company by which that Company bound themselves permanently to keep their Hull traffic on the Hull and Selby line, the North Eastern directors expressed their readiness to execute the lease alone, and the litigation in Chancery came to an end. The question of the legal rights of the Leeds preference shareholders it was found necessary to submit to the decision of a Court of Equity.

In their relations with the neighbouring companies the Board pursued an amicable policy. Important traffic arrangements were made with the Lancashire and Yorkshire, the London and North Western, the Midland and Manchester, Sheffield and Lincolnshire Companies, and with the Edinburgh and Glasgow and Scottish Central Companies, who controlled the North of Scotland traffic to and from England and had previously been in alliance with the West Coast Companies. These arrangements enabled the traffic to take its natural course. The alkali manufacturers of Newcastle were no longer obliged to receive their salt by sea from Hull, because it served the interests of an intermediate company to divert the traffic to that port, and railway passengers from the North of Scotland found the barriers removed which prevented them from booking through by the East Coast route.

During the troublous times which succeeded the fall of George Hudson, many of the powers obtained by the three Companies had expired. Under these powers 114 miles would have been added to the system. The only works in progress in 1854 were the Auckland branch, intended to form a connecting link between a great coal-field and the shipping places of the Tyne and the Wear, and a portion of the Bedale and Leyburn line between Leeming Lane and the town of Bedale, which was completed on the 1st of February, 1855. The falling in of a portion of the Bramhope tunnel on the 19th of September, 1854, made it necessary to reconstruct this portion of the work and occasioned a great deal of inconvenience to the public and the staff. Some of the passengers by the Government train from Stockton to Leeds, which entered the tunnel soon after the accident, had a terrible experience. The train consisted of two engines and tenders, eleven carriages and a guard's van, one of the engines being employed to assist the heavy train up the steep gradients to the summit point of the tunnel. About half way through the engines dashed into the large mass of stones and rubbish which had fallen, and the shock of the concussion caused the coupling chains of the fifth and sixth carriages to break. The five hindmost carriages, with the guard's van, began to descend the incline with great speed,

but the guard, though dreadfully injured, managed to apply the brakes and the carriages were brought to a standstill at Arthington station. Before the passengers could alight, however, an open third-class carriage, filled with Irish reapers, which had become detached in the tunnel, came down the incline at a frightful speed and dashed into the five carriages. No passengers were killed, but many of them were seriously injured.* For over three months the traffic between Leeds and the North was worked *viâ* York. Goods trains were able to pass through the tunnel towards the end of December, and, on the 1st of January, 1855, the tunnel was re-opened for passenger traffic.†

Two independent lines were in progress at the close of 1854—the Bedale and Leyburn and the Darlington and Barnard Castle Railways. The North Yorkshire and Cleveland Railway, though authorised in 1854, was not commenced until 1855.

The projects for new lines were chiefly connected with the opening out of the Cleveland ironstone district, the development of the West Durham coal-field, and the establishment of a communication between the hæmatite ore districts of Ulverstone and Whitehaven and the blast-furnaces of the County of Durham. The North Yorkshire and Cleveland Company proposed to throw off a short branch into the extensive ironstone fields of the Marquis of Ailesbury and to connect their line by another branch with that of the Middlesbrough and Guisbrough Company. The Middlesbrough and Guisbrough Company were desirous of being connected with the North Yorkshire and Cleveland line, but preferred to make a branch themselves.

To avoid a Parliamentary contest, the directors of the two Companies agreed that only one of the branches should be promoted in Parliament, the selection being left to an independent engineer. Mr. John Hawkshaw, the engineer appointed, decided in favour of the North Yorkshire and Cleveland Company's branch, and the Middlesbrough and Guisbrough Company therefore retired from the field.‡ A rival line was also projected at this time—the Stockton and Stokesley Railway (the Stockton and Cleveland Union Railway of 1853 somewhat modified)—the object of which was to connect the North Yorkshire and Cleveland Railway with the Tees.

The West Durham projects consisted of an independent railway from the Auckland branch along the valley of the Dearness to Waterhouses,

* *Darlington and Stockton Times*, Sept. 23rd, 1854.

† *Railway Times*, Dec. 23rd, 1854, and Jan. 6th, 1855.

‡ *Newcastle Chronicle*, Jan. 12th, 1855.

where Mr. Joseph Pease was sinking a colliery in the royalty of Viscount Boyne, and of a branch line, promoted by the Stockton and Darlington Company, from the terminus of the Dearness Valley Railway to Crook, with spurs thrown off to Stanley and Wooley. The projects more particularly connected with the conveyance of hæmatite ore were the "York and Glasgow, Stockton and Darlington, and Lancaster and Carlisle Union Railway," and the "Stockton and Darlington and Newcastle and Carlisle Union Railway," the intended course of the one being from Barnard Castle by way of Brough and Appleby to Hackworth, and the other from Stocksfield to Consett. In the session of 1855 the North Yorkshire and Cleveland and the Stockton and Darlington Companies obtained the powers they sought, and the promoters of the Dearness Valley Railway obtained an Act of Incorporation (18 and 19 Vic., c. 180, July 30th).^{*} The line authorised was $5\frac{3}{4}$ miles in length and the capital sanctioned (shares and loans) £73,000. A clause in the Act provided for the working of the line, when completed, by the North Eastern Railway Company. Shares to the extent of £15,000 had been taken by some of the directors of the North Eastern Company, and by an arrangement made with the promoters the North Eastern Company were to have reserved to them the right of taking these shares or of purchasing the line, when completed, at cost price.

In 1855 two lines, opposed to North Eastern interests, were projected in the Hull district with a junction between them. One was the "Hull and Market Weighton Railway," the other the "Hull, Goole and Doncaster Railway." The object of the first was to complete the communication between Market Weighton and Hull by way of Brough, that of the second to connect Hull with the South Yorkshire coal-field, and, by means of this connection, to raise Hull into the position of a coal-shipping port second only to Newcastle-upon-Tyne.

The Tyne Dock works, which had been suspended in 1849, were resumed this year under the powers of a new Act obtained in 1854. A short branch was constructed from Tanfield Moor to Lintz Colliery and a connection formed between the main line at Northallerton and the Leeds Northern Railway. Making no further attempt as yet to obtain a renewal of any of the powers which had lapsed, the North Eastern Company steadily pursued the policy of securing their position. Negotiations with Lord Fitzwilliam

^{*} First Directors : — William Charles Copperthwaite, George Dodsworth, George Leeman, Joseph Pease, Joseph Whitwell Pease, Nathaniel Plews, James Pulleine, and Isaac Wilson. First chairman : James Pulleine.



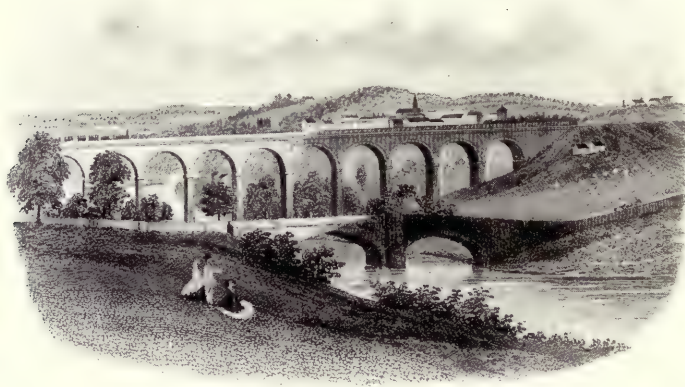
From "The Illustrated London News," June 14th, 1856.
OPENING OF SWAINSON DOCK, WEST HARTLEPOOL, 1856.

for the purchase of the Derwent Navigation, which extended from Malton to Barmby on the Marsh, a distance of 38 miles, were brought to a satisfactory termination, and, on the 1st of May, 1855, the Navigation came into the hands of the North Eastern Railway Company. Soon afterwards they took, in conjunction with the London and North Western, the Manchester, Sheffield and Lincolnshire, and the Lancashire and Yorkshire Railway Companies, a lease of the Rochdale Canal ($34\frac{1}{2}$ miles), which communicated with the Duke of Bridgewater's Canal and the Aire and Calder Navigation.

The English and Scotch Traffic Agreement, commonly called the Octuple Treaty, under which a considerable amount of competitive traffic had, since 1850, been divided among the companies owning the East and West Coast routes in certain proportions, expired in 1855, and a new agreement was concluded for a term of 14 years, dating from the 1st of January, 1856. In this agreement the "West Coast route" was defined as from London *viâ* Rugby, Preston and Carlisle to Edinburgh or Glasgow, and the "East Coast route" as from London *viâ* Grantham, Knottingley and York, or *viâ* Rugby, Normanton and York to Edinburgh. As there were two branches of the East Coast route south of York, it was a matter of no little difficulty to arrive at a satisfactory subdivision of the East Coast proportion of traffic. That the rival claims of the Great Northern and Midland Companies were amicably adjusted was largely due to the influence of the North Eastern Company's general manager, Captain O'Brien. Another agreement into which the North Eastern Company entered in 1856 practically closed the Newcastle and Carlisle line to the Liverpool traffic. Under this agreement the Newcastle and Carlisle Company were to hand over to the North Eastern Company all traffic delivered to them for conveyance to Liverpool in consideration of an allowance of 6s. 1d. per ton (4s. 5d. to go to the Newcastle and Carlisle Company and 1s. 8d. to be distributed between the Maryport and Carlisle and Silloth Bay Companies).

Meanwhile several important works in the North Eastern district were being brought to completion. On the 24th of November, 1855, the Bedale and Leyburn Railway (10 miles) was opened for goods and minerals, and on the 19th of May, 1856, for passengers. On the 3rd of June, 1856, the "Swainson" dock, with an area of 10 acres, was opened at West Hartlepool with great ceremony. Then on the 8th of July, 1856, there was no little rejoicing at Barnard Castle on the occasion of the opening of a railway which had cost so much trouble and expense to obtain. On the 13th of September, 1856, the tunnel branch of the Stockton and Darlington, from

the north end of the Shildon Tunnel to West Auckland, was opened, and the traffic from the Gaunless Valley ceased to pass over the famous Brusselton inclines of George Stephenson. The opening of a portion of the North Yorkshire and Cleveland Railway from Picton to Stokesley ($8\frac{1}{2}$ miles) and of the Whorlton branch took place on the 2nd of March, 1857. None of the works of these various lines call for any special notice. On the Bishop Auckland branch, which was formally opened on the 1st of April, 1857, by a special train of 22 carriages, drawn by one of Stephenson's patent engines (No. 55), there were several large viaducts and cuttings of engineering interest. Three of the viaducts were of stone: one over the river Wear at



From "Views of Bishop Auckland,"

1 October, 1860.

NEWTON CAP VIADUCT.

Brasside of nine arches, another over the new north road at Durham of eleven arches, and a third over the river Wear at Newton Cap of eleven arches, these several arches having, each, a span of 60 feet. The height of the Brasside viaduct was 130 feet and of the other two 100 feet. Besides these viaducts of stone there were two picturesque wooden viaducts: one over the Browney consisting of six openings of 67 feet each, about 65 feet in height, and the other over the Dearness consisting of eight openings, 80 feet in height. Then there was a great cutting 80 feet deep through the battlefield of Neville's Cross. A somewhat difficult engineering work was brought to an end on the 8th of June, 1857, when locomotive engines began to travel over a portion of the Stanhope and Tyne railway between Fatfield Gears and Stella Gill, which had formerly been worked by stationary engines.

The works which were in progress in 1854 had all been completed, the question which had caused so much dissension among the Leeds section of the proprietary had been settled in favour of the preference shareholders, and now a further fusion of interests took place by the formal amalgamation on the 13th of July, 1857, of the Hartlepool Dock and Railway Company with the North Eastern Railway Company.



SEAL OF NORTH YORKSHIRE AND CLEVELAND RAILWAY COMPANY.

CHAPTER XVI.

THE STRUGGLE FOR THE CLEVELAND IRONSTONE DISTRICT.
[1857-1861.]

When the Derwent Iron Company, soon after the opening out of the Cleveland ironstone district, took a lease of the Earl of Zetland's royalty of Upleatham, the Stockton and Darlington Railway Company had reason to congratulate themselves on the quite fortuitous circumstance that their system at one point touched the very edge of the ironstone field and at another, 54 miles away, was in contact with the principal ironworks in the County of Durham. That the ironworks at one end of the system should draw their supplies from the ironstone field at the other end of the system was about as perfect an arrangement from the Stockton and Darlington point of view as could well be imagined. It practically put £10,000 a year into the pockets of the fortunate Company. Dividends rose from 4 to 10 per cent. and the holders of Stockton and Darlington stock became, as at an earlier period in the history of the Company, the most envied of all railway proprietors. Indirectly, the Newcastle and Carlisle and North Eastern Railway Companies benefited by the consumption of Cleveland ironstone at Consett. It was found that in order to produce the best quality of iron, the Cleveland ore required to be mixed with hæmatite ore, which the Derwent Iron Company obtained from the neighbourhood of Whitehaven by way of Carlisle.

The heavy traffic to the Consett Ironworks taxed the resources of the railway companies severely. The lines which served the ironworks had been constructed for the conveyance of heavy loads in one direction only. But when the Derwent Iron Company began smelting the Cleveland and Cumberland ores instead of the ores of the local coal-measures, arrangements had to be made for conveying heavy traffic upward as well as downward. The Cleveland ore went by way of Bishop Auckland and Crook over a series of rope inclines. The Cumberland ore, brought by way of Carlisle to Redheugh, had also to ascend a number of rope inclines before it reached Consett. To get loaded waggons up the self-acting inclines between Stella Gill and Stanley, the old York, Newcastle and Berwick Company had adopted the method of using a locomotive engine to supplement the power of gravity. This example was followed

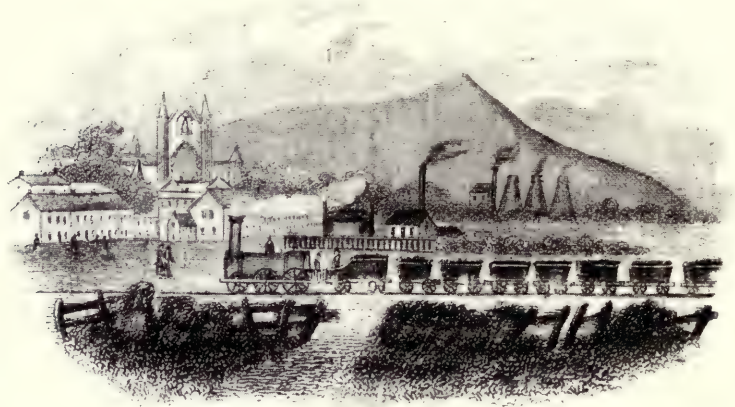
by the Stockton and Darlington Company, who employed a large and powerful locomotive engine called the "Duke" (No. 80), specially built in 1854 for the purpose, to assist the loaded waggons in ascending the Howden self-acting incline near Crook, and thus were able to work, up a gradient of 1 in 44, about a thousand tons of ironstone a day.* Hownes Gill presented a formidable obstacle to the passage of the ironstone traffic. The practice up to 1853 was to take one waggon across the ravine at a time by the curious process described at pp. 244-245. About 1853 it was found possible, by making a few alterations, to dispense with the use of the cradle and to take three waggons across at a time on their own wheels. The number was restricted to three in order to avoid putting an undue strain upon the couplings. The arrangement enabled the Stockton and Darlington Company to work from 550 to 650 waggons a day across the ravine, but it was not without drawbacks. On such steep gradients iron rails, angles, etc., coming from Consett were liable to work loose and slide off the bolsters in the waggons, causing a great detention of traffic. Methods were tried for taking across sets of more than three waggons, but nothing less than the erection of a high level viaduct seemed to offer a satisfactory solution of the difficulty. The idea of a viaduct had been discussed by the Stanhope and Tyne Board in 1836 and by the Stockton and Darlington Board in 1844 and 1853, and, after power had been obtained in 1855 to make a deviation line between Burnhill and Whitehall, which would get rid of an awkward self-acting incline, the Stockton and Darlington Board took measures for having the ravine bridged. In December, 1856, a design for the viaduct by Mr. (afterwards Sir) Thomas Bouch having been adopted, the contract was let and the work begun.

Parliamentary sanction had, this year, been given to the scheme for making a railway from Stocksfield to Cold Rowley, the subscribers (many of whom were connected with the Consett Ironworks) being incorporated under the title of the "Stockton and Darlington and Newcastle and Carlisle Union Railway Company," with a capital of £133,000.† Over the railway authorised, a portion of which was in course of construction at the beginning of 1857, it was expected that a large quantity of hæmatite ore would travel to Consett, Tow Law, and Middlesbrough.

* *Minutes of Evidence on Stockton and Darlington Railway and Cleveland Railway Bills*, 1859, p. 145.

† Act 19 and 20, Vic. cap. 94 (14th July, 1856).

The Stockton and Darlington Company now considered it expedient to strengthen their position in Cleveland by uniting the Middlesbrough and Guisbrough Railway with their system. They proposed to guarantee a dividend of 6 per cent. in perpetuity to the shareholders of the little Company on a capital of £96,000. Some of the Guisbrough shareholders stood out against the amalgamation, but, at a meeting of the Middlesbrough and Guisbrough Company, on the 5th of February, 1857, the Darlington influence prevailed, and the terms were formally accepted. No one can fail to see the strong position which the Stockton and Darlington Company had now secured for themselves in relation to the ironstone traffic. From



VIGNETTE ON SHARE CERTIFICATE OF
MIDDLESBROUGH AND GUISBROUGH RAILWAY COMPANY.

the neighbourhood of Upleatham and the slopes of Roseberry Topping their lines extended to Witton Park, Tow Law, and Consett, with a prospective communication with the Newcastle and Carlisle Railway which would enable them to intercept a considerable amount of traffic before it reached the North Eastern system. And further, on the very borders of the Cleveland district, a new iron-making centre had been established of the greatest importance to the Stockton and Darlington Railway. There were nearly as many blast-furnaces on the banks of the Tees in 1857 as in the whole of Durham and Northumberland previous to 1851.

In the various processes of iron-making fuel of all sorts was required, from the best Durham coke to the common coals which the poorest cottager

would scarcely think of using. This demand for fuel for smelting purposes led to increased activity in the coal trade, which was reflected in the revenue of the Stockton and Darlington Railway Company. On the banks of the Tees as at Consett the richer ore of Lancashire was required for mixing with the Cleveland ore, but, to get to Middlesbrough, Eston or Port Clarence, it had to travel by a very circuitous route. The wide-awake directors of the Stockton and Darlington Company now began to manifest a more than neighbourly interest in the project for a railway across Westmorland which, it was seen, would give the iron manufacturers of Cleveland access to the hæmatite ore mines of Ulverstone, and the iron manufacturers of Low Furness access to the Durham coal-field. For some time the project had made little headway owing to the differences of opinion among the promoters as to the course which the line should take beyond Kirkby Stephen towards the Lancaster and Carlisle Railway. The factor which determined the question of route was the condition attached by Mr. Joseph Pease to his promise of support—that there should be a branch to Tebay.



SEAL OF SOUTH DURHAM AND
LANCASHIRE UNION RAILWAY
COMPANY.

In order to meet the views of the Stockton and Darlington party without over-weighting the scheme, it was decided to abandon a portion of the proposed line and to substitute for it a line from Kirkby Stephen to Tebay. The requisite Parliamentary notices were accordingly given in November, 1856, for a railway commencing by a junction with the Hagger Leases branch of the Stockton and Darlington Railway at a point near the Lands Colliery and running by way of Barnard Castle and Kirkby Stephen to Tebay. The South Durham and Lancashire Union Bill passed through Parliament without opposition and received the royal assent on the 13th of July, 1857.* The line authorised was a little over 44 miles in length and the capital sanctioned £533,000. The Act confirmed an arrangement for vesting in the Company certain rights of toll in the manor of Bowes and provided for the working of the line by the Stockton and

* Act 20 and 21, Vic. cap. 40. Directors appointed by the Act: Robert Hannay, William Randolph Innes Hopkins, Thomas Macnay, Henry Pease, Henry Pascoe Smith, John Henry Stobart, James Thompson, Matthew Thompson, Robert Thompson, John Wakefield, William Henry Wakefield, John Whitwell, Rev. Thomas Witham, Isaac Wilson, John Jowitt Wilson. First chairman: John Wakefield.

Darlington Railway Company. According to the terms of a provisional agreement the latter Company were to guarantee a minimum dividend of 4 per cent. to the shareholders of the South Durham and Lancashire Union Company. For working expenses the Stockton and Darlington Company were to have 55 per cent. of the gross receipts if there should be sufficient money left to satisfy the claim after the payment of interest on loans, dividend on the paid-up capital and a reasonable amount for office expenses. Any surplus profits earned by the line after paying working expenses were to be divided amongst the shareholders of the new Company. By a supplemental agreement, the option was given to the Stockton and Darlington Company of leasing or acquiring the South Durham and Lancashire Union line on guaranteeing a preferential dividend of 6 per cent. to the shareholders.

The Darlington and Barnard Castle Railway had now become a link in another chain of communication between the east and west coasts. It was important to the Stockton and Darlington Company that such a link should be in their own hands, and they offered terms of amalgamation to the Darlington and Barnard Castle Company—a guaranteed dividend of 5 per cent. on the paid-up capital until the 1st of January, 1859, and 6 per cent. afterwards—which were accepted and embodied in a deed of arrangement.

The North Eastern Railway Company who, by their connection with the North Yorkshire and Cleveland line had access to the southern portion of the Cleveland ironstone field, were naturally desirous of securing a larger share of the ironstone traffic, and they projected a line up the Lanchester valley with the object of competing with the Stockton and Darlington Company for this traffic to the Consett Iron Works. Powers for making this branch were granted on the 13th of July, 1857. Within a few months the shadow of a great disaster fell on the Consett Iron Works. On the 27th of November, 1857, the Northumberland and Durham District Bank, to whom the Derwent Iron Company were indebted to the extent of nearly a million pounds, suspended payment, causing widespread distress throughout the North of England. The works of the Derwent Iron Company at this time consisted of 18 blast-furnaces, 543 coke ovens, 60 mine kilns for calcining the ore, besides rolling mills and foundries; they used about 600,000 tons of coal, from 300,000 to 400,000 tons of ironstone, and 110,000 tons of limestone in a year, and turned out in the same period over 150,000 tons of manufactured iron. It was of the utmost importance to the creditors of the Bank and to the North Eastern and Stockton and Darlington Railway Companies that works of such magnitude should be kept going, and a

proposal to transfer the works to a limited liability company composed of shareholders of the Bank met with general favour, an important feature of the arrangement being that the Railway Companies should give the new Company credit for their dues to the extent of £200,000.

As the demand for ironstone increased, royalty after royalty was let, fresh fields being opened for railway enterprise. The North Eastern and the West Hartlepool Harbour and Railway Companies, who had both a large interest in the capital of the North Yorkshire and Cleveland Railway Company, were desirous of obtaining an independent footing in Cleveland. The portions of the ironstone-field which the West Hartlepool Company proposed to annex to their system were the royalties of Normanby and Skelton, under lease to Messrs. Bell Brothers, the owners of important ironworks at Port Clarence, erected in 1853 on land acquired from the West Hartlepool Company.* The district which seemed naturally to belong to the North Eastern Railway Company was that already partially occupied by the North Yorkshire and Cleveland Company and the portion of the ironstone field to the south of it. From the Swainby mines in this district ironstone was already being sent to the blast-furnaces of the lessees at Stockton. The lessees of a royalty under Lord de L'Isle and Dudley were preparing to work the ironstone in Ingleby Manor, and in the most remote part of the district a lease had recently been taken of a royalty in the beautiful and secluded valley of West Rosedale by Mr. George Leeman, M.P., the deputy-chairman of the North Eastern Railway, Mr. Alexander Clunes Sherriff, until 1856 the traffic manager of that railway, and Mr. Isaac Hartas, of Wrelton. Between 3,000 and 4,000 tons of the valuable magnetic ore from the famous "quarry" near Rosedale Abbey had been carted to Pickering and conveyed by rail to Consett and other ironworks for experimental purposes, and an application was being made to Parliament by the North Yorkshire and Cleveland Company for powers to acquire the private line of the Ingleby Mining Company and to extend it to West Rosedale.

In the summer of 1857 the West Hartlepool Company projected the "Durham and Cleveland Union Railway," which was intended to connect their system with the north eastern portion of the Cleveland ironstone field.

* The reason why the firm built furnaces on the north side of the Tees, to smelt the ironstone which lay on the south side of the river, was that at Port Clarence they had convenient access to the greater part of the Durham coal-field, and could draw their supplies of fuel either from the districts served by the York, Newcastle and Berwick Railway or from those served by the West Hartlepool Railway.

The course of the line was as follows:—Branching off from the old Clarence Railway near the terminus at Port Clarence it ran down to the Tees, being carried on a jetty across the north foreshore to low water mark. From this jetty on the north to a jetty on the south side of the river it was proposed to transfer the trains by means of a steam ferry. Then crossing the Middlesbrough and Redcar Railway by a bridge, it passed in a south-easterly direction through the Normanby estate, throwing out a branch towards the authorised branch of the North Yorkshire and Cleveland Railway, and, skirting the Normanby ironstone field, ran in an easterly direction by way of Scugdale to Guisbrough, where it crossed the Middlesbrough and Guisbrough Railway. A little east of Guisbrough it took a north-easterly direction past Slapewath to a point just below Brotton, where, throwing off a branch, 7 miles long, to Staithes, it ran due north past Lumpsey and Brotton towards Huntcliff, and then, doubling back towards Brotton on the other side of Warsett Hill, it curved round to the east, terminating by a steep incline of 1 in 6 at Skinningrove, 19 miles from Port Clarence. There were two small branches for the accommodation of ironstone proprietors and connections with the Middlesbrough and Redcar and Middlesbrough and Guisbrough lines, giving a total length of $28\frac{3}{4}$ miles. The curious horse-shoe bend in the line near Brotton was made for the purpose of enabling the ironstone to be worked on both sides of the hill.

As soon as the Stockton and Darlington Company got wind of the project they prepared to resist by all means in their power the “poaching” of a rival company on what they considered their own ground. Their surveyors followed hard on the heels of the Durham and Cleveland Union surveyors, discovering the course they had taken by the pegs left in the ground. The latter, finding that they were followed, took up the pegs in certain places, and thus baffled their pursuers, who, never thinking that the Durham and Cleveland surveyors would go round Huntcliff, carried their line direct to Skinningrove, with a branch line forking off by Brotton to a point near the sea cliff. Another extension which the Stockton and Darlington Company proposed to make was from Redcar to Saltburn, chiefly for the accommodation of the Upleatham ironstone royalty, the lease of which had just been transferred from the Derwent Iron Company to Messrs. J. & J. W. Pease, this extension line being connected with the Skelton ironstone royalty by a branch running off to the southward from a point near Rifts House to Rushpool Wood. The third extension, about three-quarters of a mile in length, was intended to connect the Middles-

brough and Guisbrough Railway with the Stockton branch of the West Hartlepool system by means of a swing bridge across the Tees. It is not without significance that about this time Mr. Joseph Pease should have made application to the Crown for a grant of the foreshore, the whole width of the Normanby estate, that, in a Bill promoted by the Tees Conservancy Commissioners, five of whom were connected with the Stockton and Darlington Company, there should have been a clause for imposing a new toll on ferries crossing the river and also a clause for transferring the powers of the Commissioners in the river to the Stockton and Darlington Railway Company.*

In the midst of these preparations for strife the North Eastern Company opened negotiations with the North Yorkshire and Cleveland Company for the purchase of their line which not only was the natural outlet for the southern portion of the Cleveland district, but formed a connecting link between two parts of their system. The West Hartlepool Company, who held shares in the North Yorkshire and Cleveland Company to the amount of £38,500, might have raised difficulties, but as they wanted money for prosecuting their scheme in North Cleveland they were not indisposed to abandon their interest in the North Yorkshire and Cleveland undertaking. The terms of Amalgamation were soon settled, the North Yorkshire and Cleveland Company agreeing to take in exchange for their shares guaranteed 4 per cent. stock of the North Eastern Company equal in amount to the sums paid up on these shares. A second portion of the North Yorkshire and Cleveland line, from Stokesley to Ingleby ($3\frac{1}{2}$ miles), was opened on the 1st of February, 1858, and a third portion, from Ingleby to Kildale (2 miles), on the 6th of April, 1858. The Ingleby Mining Company's private line from Burton Head near Ingleby Greenhow to Battersby Junction (3 miles), which the North Yorkshire and Cleveland Company by arrangement with the proprietors were about to adopt as part of their proposed line to Rosedale, was also opened on the 6th of April, 1858. The Ingleby incline on this branch line—about three quarters of a mile in length, was remarkable for its gradients which averaged 1 in $5\frac{3}{4}$, the steepest being 1 in 5. The incline was self-acting, worked by steel wire ropes, 1,650 yards long, passing round drums 14 feet in diameter, these being fixed upon a horizontal shaft and controlled by powerful wooden brakes. A "run" on the incline occupied about three minutes, representing an average speed of 20 miles an hour.

* *Stockton and Hartlepool Mercury*, February 13th, 1858.

The case of the rival Cleveland railways came before Parliament in May, 1858, and formed the subject of an inquiry which lasted twenty days. It involved an unusual number of conflicting interests which complicated the general issue. The town of Stockton, which had never forgiven the Stockton and Darlington Company for founding Middlesbrough, opposed the bridge as an obstruction to navigation; the town of Middlesbrough opposed the ferry out of loyalty to the Stockton and Darlington Company and because it had already obtained Parliamentary powers to establish a ferry of its own; the Tees Conservancy Commissioners, who regarded the Durham and Cleveland Union scheme as a scheme for making West Hartlepool the port of the district, opposed both bridge and ferry on the ground that they would interfere with the navigation of the river; the landowners affected by the two schemes were nearly all in favour of the Durham and Cleveland Union line, taking the view that a company whose interests were entirely confined to the new ironstone district would have a stronger motive than the Stockton and Darlington Railway Company to accommodate and develop the resources of that district. Commercial rivalries were imported into the case. The lessees of competing ironstone mines entered into the fray. Charges of undue preference were brought against the Stockton and Darlington Board but shown to be without foundation. Allegations of unfair treatment and other attempts to throw discredit on the management of the Stockton and Darlington railway failed of their purpose. Interest in the struggle chiefly centred in the personal opposition of Ralph Ward Jackson and Joseph Pease, who fought with consummate skill and self-possession. The result of this first Parliamentary campaign was a drawn battle. Each party gained something; each party lost something. Neither the one nor the other obtained power to cross the river by bridge or ferry. The Committee of the House of Commons approved of a portion of the Durham and Cleveland Union scheme, viz., from Guisbrough to Skinningrove, without the branch to Staithes, but lopped off the remaining portion of the line between Guisbrough and the river because, in their opinion, it would almost have rendered necessary the crossing by the ferry which they considered objectionable. They advised the promoters of the scheme to stop for the time being at Guisbrough which they described as a good halting-place, stating that it would be open to the Company to make at some future time a more direct communication with the West Hartlepool system than what they could obtain by means of the Stockton and Darlington and North Eastern lines. The effect of their decision, they admitted, would be to

leave the Durham and Cleveland Company in the hands of the Stockton and Darlington Company, but they observed that if the Stockton and Darlington Company did not give them every possible accommodation it would be very unwise on their part, and the Durham and Cleveland Company would have very good grounds for coming to Parliament again. A portion of the Stockton and Darlington Bill was passed—the extension of the Redcar line to Saltburn with the small branch into the Skelton estate. The refusal of the Committee to sanction the crossing of the Tees by a bridge caused immense satisfaction in Stockton which was expressed, on receipt of the news, by the firing of cannon and the ringing of church bells.

The Durham and Cleveland scheme was no more acceptable to the Stockton and Darlington Company in its curtailed than in its complete form. The brilliant counsel, Mr. Hope Scott, no doubt expressed their views when he said that, made and worked by a company in constant competition with them, the line “would be the lodgment of an enemy in their district, and a lodgment which would result in a renewal of the attempt to get a competing line, so as to become, not their feeders but their robbers.”* When, under the title of the Cleveland Railway, the scheme came before a Committee of the House of Lords, the Stockton and Darlington Company were there to oppose it, but the Committee refused to allow them to be heard, and on the 20th of July, 1858, the Bill passed, receiving the royal assent three days later. The Cleveland Railway Act (21 and 22 Vic., cap. 114) enabled the Company to make a railway from a point near Guisbrough to Skinningrove ($10\frac{3}{4}$ miles), with a short connecting line near Guisbrough ($\frac{1}{4}$ mile) and a branch to Rawcliff Banks into the estate and ironstone royalty of Mr. John Thomas Wharton, of Skelton Castle ($\frac{1}{2}$ mile), authorised them to raise a capital of £120,000 in shares and £40,000 by loans (the West Hartlepool Company being empowered to subscribe half of the former amount), appointed directors,† confirmed an arrangement that only the distance of a direct line to Skinningrove should be charged for, viz., $8\frac{1}{2}$ miles, instead of 11 miles, and provided for the working of the line by the West Hartlepool Company.

Though the Stockton and Darlington Company had failed to keep their West Hartlepool rivals out of Cleveland, they had no reason to be dissatisfied with the results of the session of 1858, for Parliament had not only authorised

* *Darlington and Stockton Times*, July 17th, 1858.

† Charles Attwood, Charles Barrett, Isaac Lowthian Bell, John Bell, Ralph Ward Jackson, William Charles Ward Jackson, Richard Sheraton Johnson, Robinson Watson and Cuthbert Wigham. First chairman: Ralph Ward Jackson.

them to extend their Redcar line to Saltburn and Skelton, to connect St. Helen's Auckland with Bishop Auckland by a short branch from Fieldon's Bridge, and to alter and improve their main line north of Crook, but to unite, under the powers of an Act of Amalgamation, the lines held on lease, viz., the Wear Valley, Middlesbrough and Redcar, Middlesbrough and Guisbrough, and Darlington and Barnard Castle Railways with their own. Parliament had also sanctioned a scheme, in which they were interested, for a line from Kirkby Stephen to Clifton, resuscitated by the gentlemen of Westmorland soon after the passing of the South Durham and Lancashire Union Bill in 1857. By Act 21 Vic., cap. 14, May 21st, 1858, the subscribers



SEAL OF EDEN VALLEY
RAILWAY COMPANY.

were incorporated under the title of the Eden Valley Railway Company, with powers to raise a capital of £180,000 in shares and by loan, provision being made for the working of the line by the Stockton and Darlington, Lancaster and Carlisle, or the South Durham and Lancashire Union Company.* It was expected that the Eden Valley would be the route by which the hæmatite ore from the Whitehaven district would travel to the Tees, and on this account some of the Ulverstone shareholders of the South Durham and Lancashire Union Company had tried to prevent that Company from encouraging the scheme.†

The first of the improvements in their line undertaken by the Stockton and Darlington Company for the better accommodation of the ironstone traffic had now been completed at a cost of £15,756. This was the Hownes Gill viaduct, a picturesque structure of firebrick 730 feet in length, consisting of 12 semicircular arches supported on piers of light proportions, carrying the rails at a height of 150 feet from the surface of the ground, the foundations of the central piers being strengthened by means of inverts. The first train passed over the bridge on the 1st of July, 1858, a year and five months after the laying of the first brick.‡ The second improvement

* Directors appointed by the Act: Robert Addison, James Atkinson, William Brougham, William Crackanthorpe, John Crosby, Rear-Admiral Russell Elliott, William Hopes, William Randolph Innes Hopkins, Henry Pease, Sir Richard Tufton, Bart., John Whitwell and Isaac Wilson. First chairman, Rear-Admiral Russell Elliott.

† *Railway Record*, May 1st, 1858.

‡ *Proceedings of the Institute of Civil Engineers*, vol. xxii., pp. 44-57.



From a photograph taken in 1888

HOWNES GILL VIADUCT.

—the Waskerley deviation—made for the purpose of enabling the locomotive engines to travel right on to Carrhouse, was not completed until a year later, the line being opened on the 4th of July, 1859. It had been intended to make another deviation from Crook to Tow Law, in order to get rid of the Sunnyside incline, the gradients of which (1 in 13 and 1 in 16), though not insurmountable by the stronger locomotive engines of this period,* were sufficiently severe to prevent locomotive engines from being used beneficially on this part of the line. On account, however, of the opposition of Mr. Charles Attwood, who alleged that the new line would pass over ground on which he contemplated erecting a number of furnaces, the clauses relating to this deviation were withdrawn from the Durham Lines Bill of 1858.

The Stockton and Darlington Company had not been mistaken in thinking that their opponents would renew their attempt to get to the river from Guisbrough. A Bill for the extension was deposited as soon as practicable. The Cleveland Company, of course, knew that it was futile to come before a Committee of the House of Commons and ask for power to extend their line to Cargo Fleet in the hope of some day being allowed to cross the river by bridge or ferry. But just at the most convenient moment they made the discovery that there was a prospect of Cleveland ironstone being shipped from the Tees to the Tyne and even from the Tees to the north of France. A pier or jetty in the Tees, from which ironstone could be conveyed in barges to works up the river and carried in the bottoms of sea-going ships to distant ironworks, was clearly a desirable adjunct to a railway like theirs. Another object of the extension was to give better accommodation to the Normanby ironstone, which, under the arrangements then in force, travelled by a circuitous route to a point on the river near the entrance of the channel leading to Middlesbrough Dock, passing over a private line of the lessees, the Middlesbrough and Guisbrough Railway, several lines of the Stockton and Darlington Company, and a private line of the Middlesbrough Owners. Ironstone for Stockton had to go round by Preston Junction.

In order to cut away the ground from under the feet of their opponents the Stockton and Darlington Company brought in a Bill to authorise the making of a short curve from their own line into the Leeds and Stockton line of the North Eastern Company near Hartburn, as suggested to them by

* On the 9th of June, 1859, a new engine, the "Gazelle" (No. 125), took a carriage containing 12 persons up the incline at a speed of five or six miles an hour. *The Engineer*, 1862, p. 86.

Mr. T. E. Harrison, and to sanction the purchase of the private line of the Middlesbrough Owners on the north side of Middlesbrough Dock, binding themselves by stringent clauses to afford every facility to the mineral traffic of the Cleveland Railway which was to be placed in every respect on an equal footing with their own. The North Eastern Company, who were on perfectly friendly terms with both the Stockton and Darlington and the West Hartlepool Companies, readily consented to the removal of a six-mile clause barrier which stood in the way of the traffic going northward of the proposed Hartburn Junction, agreeing to limit their tolls on mineral traffic from the district of the Cleveland Railway passing over this portion of their line to any place served by the West Hartlepool Company to 3d. per ton.

The Cleveland Extension Bill, after a strong opposition from the Stockton and Darlington Company backed by the Tees Conservancy Commissioners, was passed unanimously by a Committee of the House of Commons, but it was rejected by a Committee of the House of Lords on the ground that the extension would form a competing line with the Guisbrough branch of the Stockton and Darlington Company. The Committee, however, in rejecting the Bill, thought that it was quite admissible for the owners and lessees of the ironstone on the northern slopes of Eston Nab in the Normanby and Ormesby estates to make a private line to the Redcar Branch and to convey their ironstone to Middlesbrough along this branch instead of the Guisbrough Branch, and they required the Stockton and Darlington Company to insert clauses in the Bill which that Company was then promoting in Parliament, binding them to carry the traffic from the junction to the shipping-place at certain stipulated charges, and to erect within six months two additional staiths on the bank of the river near Middlesbrough Dock for the accommodation of the ironstone traffic.

Soon afterwards the Stockton and Darlington plan for giving the Cleveland Railway Company better communication with the West Hartlepool Railway and for securing their access to the staiths at Middlesbrough received the sanction of Parliament. The only course which was now left open to the originators of the Cleveland Railway was to act on the hint thrown out by the Committee of the House of Lords, and make a railway to serve the ironstone royalties on the north side of Eston Nab, keeping in view the object of connecting it eventually with the Cleveland Railway. For a private railway shipping at Middlesbrough they substituted a public railway with an independent shipping-place at Cargo Fleet, which was duly registered under the title of the "Upsall, Normanby

and Ormesby Railway." It was evident, from the gradients adopted, that the line had been planned with the intention of being ultimately connected with Guisbrough, and the Stockton and Darlington Company prepared to oppose it. The only ground of opposition which they could take up in Parliament was that the line crossed the Redcar branch by a bridge, and they knew it would be difficult to defeat a Bill on these lines. Chance, however, had made them masters of the river-frontage and they resolved to take advantage of this circumstance and attempted, by legal methods, to exclude the Normanby owners from the foreshore. They accordingly claimed, as the owners of a strip of land with a river-frontage extending the whole width of the Normanby estate, to have the pre-optional right of acquiring the land on the foreshore. It was subsequently decided by the Attorney-General that the right claimed belonged to the Normanby owners who, acting on this decision, obtained from the Crown a lease of the foreshore for 99 years. Even then the Stockton and Darlington Company would not acknowledge themselves beaten. In their Capital Bill of 1860 they inserted clauses for the compulsory purchase of the Normanby foreshore which was ostensibly required for sidings and other purposes only indirectly connected with railways. In March, 1860, the Upsall, Normanby and Ormesby Bill came before a Committee of the House of Commons, who did not consider that compulsory powers were necessary for achieving the objects of the promoters provided the Stockton and Darlington Company would allow a bridge to be made over their Redcar branch. The Stockton and Darlington Company agreeing to do this, the Committee declared the preamble of the Bill not proved. The following day they struck out of the Stockton and Darlington Bill the clauses for securing powers over the foreshore of the Normanby estate, leaving the promoters of the Upsall, Normanby and Ormesby Railway free to carry out their designs without fear of interruption from a powerful company.

Mr. Jackson and his colleagues had now to encounter obstructive tactics on the part of the Tees Conservancy Commissioners which seem to have been inspired from Darlington. The Commissioners had given their consent to the construction of a jetty subject to the provisions of a Bill which did not pass into law. They held that, as the Bill was rejected the agreement into which they had entered came to an end and they declined to allow the jetty to be made without another agreement. The statement made to the Committee of the House of Commons by their representative certainly lent colour to the belief that they would act in the spirit of the agreement, even though no longer valid, and on the 12th of April, 1860, Mr. Jackson's engineer staked

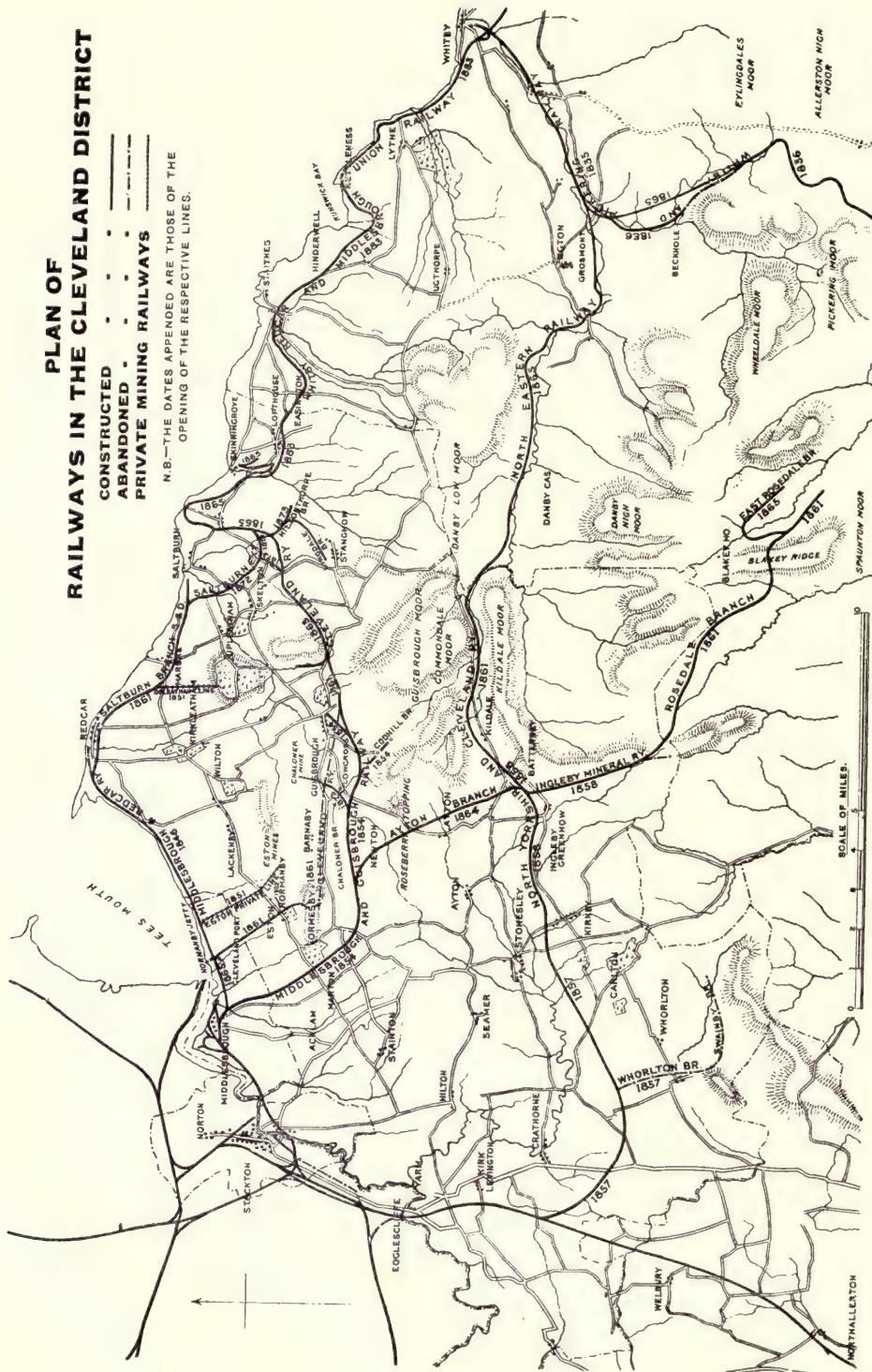
out the pier on the foreshore. On the 23rd of July, when about half of the pier was completed, a bill in Chancery was filed against Mr. Ralph Ward Jackson and other representatives of the Normanby owners to restrain them from proceeding with the works. The Tees Conservancy Commissioners failed to satisfy the court that the pier would be injurious, and on the 17th of August, the Vice-Chancellor decided against their application. The Commissioners thereupon fell back on ruder methods of obstruction which led to what is known as the "Battle of the Tees." They ordered a number of barges to be moored in front of the works for the purpose of preventing the extension. It was the long vacation and there was no getting proceedings before the Courts of Law. Mr. Jackson, therefore, decided to take summary means of raising the blockade. On the 10th of September, 1860, he hired a number of hands to clear away the barges. While they were engaged in removing the anchors and holdfasts of the barges, a steam-tug came down the river with Mr. Fowler, the engineer of the Commissioners on board, who tried to prevent the removal of the barges, but his men were driven back by the superior force under Mr. Jackson. Having got rid of the obstruction, Mr. Jackson had the space which the pier was intended to occupy enclosed by chains attached to large buoys. He then bought up most of the barges and secured the services of the men for the defence of the works. About 11 o'clock at night the engineer of the Commissioners, expecting to find the pier unprotected, came down the river with three steam-tugs for the purpose of damaging the works. Hardly had his men begun to pull down some of the piles than they were attacked by the very men who had fought for the Commissioners in the morning. There was a severe hand to hand conflict between the two parties in which one of the defenders of the pier received a dangerous wound from a boat-hook, and ultimately the steam-tugs were driven away under a steady shower of paving-stones, pieces of slag and lumps of ironstone. The following day Mr. Jackson called upon the police to protect the property, and the works were watched night and day until completed.

Another stage in the struggle between the West Hartlepool and Stockton and Darlington interests was reached in November, 1860, when Captain Chaloner, the owner of the Guisbrough estate, and one of the promoters of the Cleveland Railway, prepared to make a line through his estate to the Upsall, Normanby and Ormesby Railway, for the ostensible purpose of conveying his minerals to the Tees by means of that railway. The Stockton and Darlington Company opposed before the magistrates the making of a bridge over their Guisbrough branch to carry this private line, but the magistrates

PLAN OF RAILWAYS IN THE CLEVELAND DISTRICT

CONSTRUCTED - - -
ABANDONED - - -
PRIVATE MINING RAILWAYS - - -

N.B.—THE DATES APPENDED ARE THOSE OF THE
OPENING OF THE RESPECTIVE LINES.



sanctioned the bridge, and it was afterwards built, sinister rumours, meanwhile, circulating in the district that it had to be blown up by some person connected with the Stockton and Darlington railway as soon as traffic began to pass over it. After having been opposed both in Parliament and out of Parliament, and faced with difficulties at every point, Mr. Ralph Ward Jackson had after all gained his end. The line from Skelton New Mine to the Tees, though constructed piecemeal—part of it authorised and part of it made under wayleave agreements—was, save for a slight deviation in the Normanby estate, the same line as that promoted in 1858. There was only one thing more to do—to get the assent of Parliament to an accomplished fact. A Bill to secure that object was drafted in 1860 and, in 1861, Parliament was called upon for the fourth time to hear the story of the wicked railway company and the much enduring ironstone lessees. The promoters of the Bill had little further to say in support of their application. They dwelt on the obstacles thrown in their way by the Stockton and Darlington Company and the authorities whom that Company could influence. They proposed on this occasion to carry the loaded waggons of ironstone across the river in open barges, sufficiently large to take twenty-four waggons each. The Stockton and Darlington Company argued that there were no changes of circumstance to warrant the reversal of previous decisions, and complained bitterly of the hardship of being brought to the Committee Rooms of the House so repeatedly. Between £8,000 and £10,000, they declared, had been spent in providing accommodation for the Cleveland Company's traffic. In their opposition they were strongly backed up by the Tees Conservancy Commissioners. It was evident to the Committee that if matters remained any longer in this unsettled condition the public interests would suffer from the bickerings of the two companies. They, therefore, decided to pass the Bill subject to stringent provisions for safeguarding the rights of the Tees Conservancy Commissioners and for ensuring the completion of the line to Skinningrove.

The position of the several railway companies in Cleveland may now be briefly indicated. The North Eastern Railway Company had penetrated into the ironstone field as far as West Rosedale and Castleton, having opened their Rosedale branch on the 27th of March, 1861, and an additional portion of the North Yorkshire and Cleveland main line from Kildale to Castleton on the 1st of April, 1861. They were now making the Ayton branch, from Battersby to Nunthorpe, and preparing to complete the North Yorkshire and Cleveland main line under renewed powers granted this session; the Stockton and Darlington Company had reached Saltburn, opening the line to that place on

the 17th of August, 1861, and intended to carry a line from this branch to a point in the Skelton estate near Marske Mill in lieu of one previously authorised; the Cleveland Railway Company had reached Skelton New Mine and on the 23rd of November, 1861, opened the line from that point to Normanby Jetty, a distance of 13 miles. Of this line the principal features were a heavy cutting east of Guisbrough and a viaduct over the Waterfall Valley consisting of eight arches of 40 feet span each and 60 feet high. In the midst of all this activity in the Cleveland ironstone district it is not without interest to read, under date of August 17th, 1861, that a cargo of ironstone from the Spanish port of Santander, destined for the blast furnaces at Ferryhill, was then being discharged at the Victoria Dock, Hartlepool—the first importation of Spanish ore to the North East Coast.



SEAL OF CLEVELAND RAILWAY COMPANY.

CHAPTER XVII.

SCHEMES OF INVASION THAT WERE FOILED.

[1857-1865.]

Up to 1858 the North Eastern Railway Company enjoyed one very great advantage—they had peace in their borders. While the Caledonian and the Edinburgh and Glasgow Companies were battling in the north, and the London and North Western Company with their allies and the Great Northern Company were fighting recklessly in the south, the North Eastern Company were quietly developing their resources and fortifying their position by means of traffic arrangements. What the Chairman said in August, 1856, of the previous half-year's working might have been said at every one of the early meetings of the Company—"It had been a very quiet half-year in which they had been paying their best attention to their business."* They were not threatened by competition at any point of their system. The Stockton and Darlington Company, though resenting the intrusion of the North Eastern Railway into the Auckland district, were outwardly friendly. The West Hartlepool Company had already been discussing terms of amalgamation with the North Eastern Company.

In 1857, the "Euston Square Confederacy"—as it was called, fell to pieces under the pressure of the forces of self-interest. It only needed the opening of two or three connecting lines at strategical points to alter completely the relations between the leading companies owning the East and West Coast routes. The opening of a line from Leicester to Hitchin, viewed by itself, appears to be nothing but a natural extension of the Midland Railway to a convenient point for the interchange of traffic. The running of Midland trains over Great Northern rails to King's Cross follows as a matter of course. About the same time it happens that a comparatively unimportant line, the "Little" North Western Railway, is leased in perpetuity to the Midland Company. Taken by itself, this event appears to have no special significance. But the Lancaster and Carlisle Company obtain a renewal of powers, which the "Little" North Western Company had allowed to lapse, for the making

* *Newcastle Chronicle*, August 29th, 1856.

of a line between Ingleton and Low Gill. The Caledonian Company revive their scheme for a railway between Carlisle and Hawick by way of Langholm. The North British Company, in self-defence, take up a similar scheme for a line from Hawick to Carlisle, running through Liddesdale instead of Teviotdale, and bring it out under their own auspices. Making a plan of all these lines—of the Great Northern from London to Hitchin, of the Midland from Hitchin to Ingleton by way of Leeds and Skipton, of the Lancaster and Carlisle from Ingleton to Carlisle, and of the North British from Carlisle to Edinburgh, we discover that a new route has been made available between London and Edinburgh, fraught with danger to East Coast interests if either the Great Northern or North British Company should fail in their allegiance. Such a contingency was very remote in the case of the Great Northern Company, who had nothing to gain by diverting their traffic at Knottingley from the East Coast lines. As to the North British Company, they were showing symptoms of estrangement. They suspected the existence of a secret agreement between the North Eastern and Caledonian Companies with regard to a portion of the Newcastle and Glasgow traffic, and they regarded with no friendly eye the possibility of an amalgamation between the North Eastern and Newcastle and Carlisle Companies.

At this time the Border Counties line, following a similar course to that of the proposed branch of the Newcastle and Carlisle Railway from Warden to Woodburn in 1845, was advancing up the valley of the North Tyne, and the North British Company feared that, if it should fall into the hands of the North Eastern Company, their entrance into Carlisle might be barred. For the North British Company a footing in Carlisle was a strategical necessity. "The North British Company," wrote the *Railway Times*, "must either submit to be expunged from the political railway map of the country, and sink down into a mere dependent of the North Eastern while the Caledonian with its southern and northern alliances rides roughshod over its East Coast competitor, or the latter must establish for itself outlets that can be felt even in the centre of England."* The Hawick and Carlisle Junction line, though projected as a measure of defence against Caledonian aggression, had been put forth with the recommendation that it would form "a third route from Edinburgh to the south." There was thus a possibility of its being used adversely to North Eastern interests.

* *Railway Times*, February 20th, 1858.

With a footing at Carlisle, the North British Company would at any rate be in a better position for bargaining when the terms of a new traffic agreement came to be discussed. An amalgamation between the North Eastern and North British Companies, therefore, appeared desirable from the points of view of both Companies. Deputations from the respective Boards met in 1857 to deliberate on the terms and conditions of union, but the North British representatives, insisting that the gross and not the net revenue should be made the basis of arrangement as to terms, the negotiations were brought to an abrupt termination. They were resumed in March, 1858, without any better result. The North British Company then determined, not only to reach Carlisle, but to extend their influence southwards to Newcastle. The only obstacle to the realisation of their plans was the "blockading" line of the Caledonian Company.

The North British policy was, at this time, directed by a very able railway tactician, Mr. Richard Hodgson, of Carham, who occupied the position of Chairman. His plans for obtaining an independent access to Newcastle displayed clever strategy. There were at this time in South Northumberland two railways which had not been absorbed by the North Eastern Railway Company—the Newcastle and Carlisle and the Blyth and Tyne Railways. By means of these lines Mr. Hodgson hoped to effect his purpose.

In accordance with his plans the North British Company formed an alliance with the Border Counties Company, thus securing a base at Hexham for future operations. For many years the Blyth and Tyne Railway had been a negligible factor in railway politics. In 1855 it was little better than a waggonway carrying a few passengers in low-roofed springless carriages locally called "bumler boxes."* But under the spur of competition, the Directors of the Blyth and Tyne Company were obliged to adopt a policy of improvement and extension. They cut down Prospect Hill again, doubled six miles of railway, built additional shipping staiths in the Tyne, purchased two short colliery lines which formed portions of their main line between Seaton Delaval and Hartley and between Bedlington and Newsham, made a branch line to Morpeth and took the preliminary steps towards extending their line to Whitley and North Shields. The inclusion of their coal-shipping staiths in the Northumberland Dock (which was opened on the 22nd of October, 1857), gave additional value to their railway as an outlet for the mineral produce of the Northumberland steam-coal district. In

* Chairman's speech, August 30th, 1865. *Railway Times*, September 2nd, 1865.

October, 1857, the Morpeth branch was opened for mineral traffic, and on the 1st of April, 1858, for goods and passenger traffic.

A few months later the rest of the North British plans came to light when a scheme was launched under North British auspices for connecting the Border Counties and Blyth and Tyne Railways by means of a railway running along the Wansbeck valley. No one could doubt what was the real object of the line, which passed through a thinly-populated district without manufactures and with very few mineral resources. It was obviously promoted to complete a new route between Morpeth and Edinburgh, which would enable the North British Company to coerce the North Eastern Company into paying them a larger proportion of the joint revenue or offering better terms of amalgamation. The North Eastern Board could not but regret this hostile attitude on the part of a Company from whom they reasonably expected the friendliest co-operation, and they prepared to resist the threatened incursion. Their first object was to gain possession of the Newcastle and Carlisle Railway. Overtures were made to the Newcastle and Carlisle Board in the autumn of 1858 with a view to a permanent union. Terms were discussed and settled in January, 1859, receiving the approval of the North Eastern proprietors on the 18th of February, 1859.

Having strengthened their defences on the west by this agreement with the Newcastle and Carlisle Railway Company, the North Eastern Railway Company were almost immediately afterwards enabled to improve their already strong position in the North of England by opening for traffic on the 3rd of March, 1859,* the great coal-shipping dock at Jarrow which had been in course of construction since the summer of 1855. Not only had they found it extremely difficult to accommodate all their traffic at the Brandling and Pontop drops, but the working expenses were very heavy. At the new dock the waggons, instead of being drawn to and from the spouts by horses and pilot engines ran in both directions on self-acting inclines, the cost of working being considerably reduced. The dock, as completed, consisted of a basin of 50 acres, with a depth of 24 feet 6 inches at an average spring tide, affording accommodation for 400 or 500 vessels, a tidal basin $9\frac{1}{2}$ acres in extent, a main tidal entrance 80 feet in width in the clear, and a lock, 300 feet long by 100 feet wide, with iron gates 60 feet in width and weighing between 500 and 600 tons, which might be worked

* The dock was partially opened for traffic in January, a large river barge on the 6th, and sea-going brig on the 22nd, having been loaded with coals at No. 3 jetty.



From a painting by J. Scott.

OPENING OF TYNE DOCK (MARCH 3RD, 1859).

either by hand or by hydraulic machinery. There were four jetties projecting into the dock, two being used for the shipment of coals and two for the delivery of ballast and goods.

The Auckland branch, as stated by Mr. H. S. Thompson, had been made with special reference to this dock, and neither the West Hartlepool Harbour and Railway Company nor the Stockton and Darlington Railway Company could doubt that, with their rapid loading facilities at Tyne Dock, the North Eastern Company would be able to compete successfully with them for the traffic from West and South West Durham. Both Companies were therefore prepared to enter into any coalition which might be formed against so formidable a competitor.

In the southern part of the system the outlook was also threatening. At least two attempts had been made to project lines into North Eastern territory with the special object of improving the communication with Harrogate. The question of giving better accommodation to this important watering-place was thus forced upon the attention of the North Eastern Board, and they applied to Parliament in 1859 for powers to enable them to make a loop line, about $4\frac{1}{2}$ miles in length, between the Crimble valley and Bilton—part of the line being a partially formed and abandoned branch of the Leeds Northern Company—and to build a central station at Harrogate. It also seemed expedient to the Board to extend the North Eastern system up the valley of the Nidd to Pateley Bridge—another of the abandoned schemes of the Leeds Northern Company—especially as the landowners had come forward and offered to sell the land required for the line on very reasonable terms. Between the Leeds Northern line and the Midland and Lancaster and Carlisle lines lay a vast tract of country often surveyed for, but not as yet occupied by, a railway and it was important to prevent any rival company from establishing itself at some point of vantage in this district. With this object in view the North Eastern Company had entered into a provisional agreement to take the Bedale and Leyburn Railway into their own hands as from the 1st of January, 1858, and now brought in a Bill to legalise the arrangement.

It was evident from these precautionary measures that the defence of the North Eastern Railway was in able hands. For five years the North Eastern Company had been at peace with their neighbours, and now, at the close of this first lustrum, they found themselves threatened by attack from two quarters. Hostile proceedings were begun by the North British Company in concert with the Carlisle and Silloth Bay,

the Port Carlisle and Border Counties Companies, a bill being filed in Equity in the name of two dissentient shareholders of the Newcastle and Carlisle Company to upset the working arrangement made between the North Eastern and Newcastle and Carlisle Companies. The negotiating companies having been advised that some of the terms of the arrangement were in excess of their legal powers cancelled the agreement of the 2nd of May, and on the 5th of July, 1859, entered into a second agreement which embodied a working arrangement confined simply to carrying the through traffic common to both lines. An injunction striking at the first agreement was issued soon afterwards by the Court of Chancery, who did not impugn the second agreement. As a consequence of these proceedings the Newcastle and Carlisle Company resumed possession of their rolling stock, and took the management of the line again into their own hands.

At Westminster the North British Company had a series of successes. They defeated the Caledonian Bill, backed up as it was by the North Eastern Company, and obtained an Act for their Border Union line. The Liddesdale section of the Border Counties Railway, which was necessary to complete the connection between Edinburgh and Hexham, and the Wansbeck Valley Railway also received the sanction of Parliament. The North British Company and their allies—the Border Counties, the Wansbeck, the Carlisle and Silloth Bay and the Port Carlisle Companies, then entered into traffic arrangements with the Blyth and Tyne Company, who were not a little astonished at receiving so much flattering attention. It would have been difficult to assign a limit to North British ambitions at this time. No sooner had they piloted the Wansbeck Valley scheme through Parliament than they endeavoured to get a company formed to make a line from the Wansbeck Valley line near Scots Gap to Wooler by way of Rothbury and Whittingham, keeping in view the possibility of a future extension of this line to Jedburgh. When the Wooler Railway scheme was made public the people of Alnwick rose up in arms against it. This railway, it was seen, would withdraw the traffic of an important district from the town, and meetings were held to consider the possibility of making a railway from Alnwick by way of Whittingham and Glanton to Wooler and thence to Kelso. In compliance with a request from the town, the North Eastern Board arranged to have a survey made for the line, and in view of any further difficulties with the North British Company instructions were given to the engineer to extend the survey from Kelso to Edinburgh.*

* Evidence on the Newcastle, Derwent and Weardale Junction Railway Bill.

The North Eastern Company had also to meet at this time a dangerous attack from the west. It originated with some of the directors of the South Durham and Lancashire Union Company, and was intended to open out a new route between Newcastle and Lancashire. The point attacked was the valley of the Derwent. The powers of the Stockton and Darlington and Newcastle and Carlisle Union Company had expired, leaving only a small portion of the authorised line constructed between Crook Hall and the Derwent Iron Company's works. A company was therefore formed with the ostensible object of taking up the work of giving railway accommodation to the Derwent Valley. The line proposed was only $13\frac{1}{2}$ miles in length, extending from the Stockton and Darlington Railway at Hownes Gill to the Newcastle and Carlisle Railway at Scotswood, a line apparently of merely local importance, but in reality an invaluable link in the chain of communication extending from Edinburgh to Liverpool. Let us bear in mind the following circumstances: that the North British Company had completed their arrangements for uniting the Border Counties Railway with their own system, that they were applying for running powers over the Newcastle and Carlisle Railway to Newcastle and counted upon sending a considerable quantity of clay-band ironstone from the neighbourhood of Bellingham to the Consett and Tow Law Ironworks, that the Stockton and Darlington Railway Company, who were the lessees of the South Durham and Lancashire Union line, and the owners of the line between Hownes Gill and West Auckland desired, for purposes of retaliation, an independent access to Newcastle—and we shall see that the valley of the Derwent was a pass of the highest strategical importance which it behoved the North Eastern Company to safeguard at all costs. Recognising the mistake which they had made in leaving so important a position unoccupied, the North Eastern Company immediately ordered a survey to be made for a line up the Derwent valley commencing near Scotswood bridge and terminating by a junction with the authorised line of the Lanchester Valley Branch. Up to this time no sod had been turned on the Lanchester Valley Branch in consequence of the unsettled condition of the Derwent Iron Company's affairs, but the Court of Chancery having at last, on the 15th of December, 1859, sanctioned an arrangement under which the Consett Iron Works of the Derwent Iron Company might be carried on, it was decided to proceed with the construction of the branch.

While the North Eastern Company were thus grappling with the difficulties of a dangerous situation they were called upon to meet an attack directed

against them from the Pontop district, a competing line having been projected by a number of the coal owners in that district, called the "Sacriston Junction and South Shields Railway." Certain very substantial concessions were offered, which induced the coal owners to withdraw the scheme and to enter into an agreement as to dues for a period of 15 years.

The Parliamentary campaign upon which the North Eastern Railway Company entered in 1860, involved some very important issues and demanded increasing vigilance and tactical skill. Three Bills were promoted by the Company themselves, one to sanction the amalgamation of the North Eastern and Newcastle and Carlisle Companies, another to empower the Company to make a branch line from Blaydon to Consett, and a third to authorise an extension of time for the completion of the Lanchester Valley Branch and to amend provisions in the Company's Acts as to tolls on coals for shipment conveyed along the Newcastle and North Shields line. Eight Bills were opposed by the North Eastern Company, the most important of them being a Bill for the amalgamation of the Caledonian, the Edinburgh and Glasgow and Scottish Central Companies in which there were no provisions for the protection of East Coast interests, a Bill to legalise a traffic agreement between the London and North Western and Great Northern Companies, clauses in the agreement binding the two companies to work in every way for their own mutual interests and against every other company, and a Bill to incorporate the Newcastle and Derwent Valley Company and to enable them to make a railway from Scotswood Bridge to Hownes Gill.

This Parliamentary contest of 1860 marks a critical stage in the history of the North Eastern Railway. Had the North Eastern Board failed to realise the significance of the Derwent Valley scheme, the subsequent course of events might have been very different. An error of judgment at this juncture would have been fatal, for there can be little doubt that the loss of the Derwent Valley would have meant the admission of the London and North Western Company into Newcastle, and the introduction of competitive warfare into the very heart of the North Eastern system. That the North Eastern Board recognised the gravity of the situation is evident from the measures which they took to defeat the ulterior objects of the Newcastle and Derwent Valley Bill. Unknown to the promoters of this Bill, they approached the Stockton and Darlington Board with a proposition for amalgamation. So far the Stockton and Darlington Company had not given the Newcastle and Derwent Valley scheme their official support, though influential members had expressed approval of the scheme

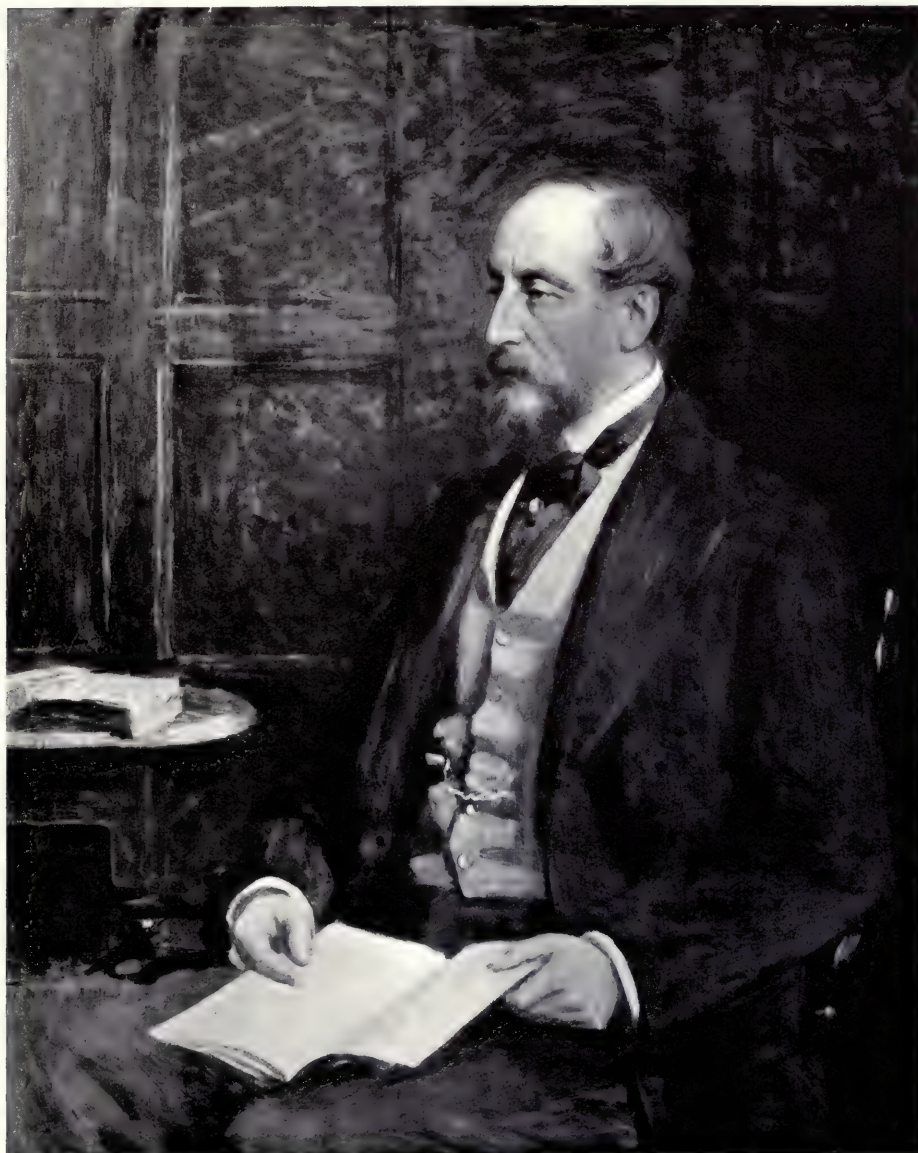
and assured the promoters that the gradients of the line between Tow Law and Crook would be improved to enable locomotive engines to travel throughout from Newcastle to Liverpool. They were therefore at liberty to discuss terms of amalgamation with the North Eastern Railway Company. They had foreseen that the time would come when they would have to choose between an alliance with the London and North Western Company or an alliance with the North Eastern Company. The North Eastern Company had already begun to compete with them by taking goods traffic from Bishop Auckland to Darlington and from places south of Darlington to Bishop Auckland round by Leamside, and were actually preparing to wrest from them as large a portion of their ironstone traffic as they could by means of the Lanchester Valley branch. The Stockton and Darlington Company were therefore not indisposed to treat with the North Eastern Company for a union of interests. As both parties desired an amalgamation, it was not long before they came to terms, the basis of the agreement being that the Stockton and Darlington section of the shareholders should receive $15\frac{1}{4}$ per cent. of the joint receipts, and that the traffic and other local matters connected with the Stockton and Darlington district should be managed for a fixed period by a separate committee.

It had leaked out in February at the half-yearly meeting of the North Eastern Company that negotiations of some kind were in progress between the North Eastern and Stockton and Darlington Boards, but the Newcastle and Derwent Valley Company do not appear to have guessed the nature of these negotiations. Suspicions were first aroused by the hesitation of the Stockton and Darlington Board to commit themselves to any definite arrangement as to the improvement of the gradients of their line between Tow Law and Crook, and by an intimation from the Directors of the South Durham and Lancashire Union Company that they would be unable for a time to co-operate with the provisional committee of the Derwent Valley scheme, though reserving to themselves the liberty of doing so at a future period.* No little indignation was felt by the leading spirits of the Derwent Valley scheme when they found at the very time that the Bill was going into committee that they had been thrown overboard. By one adroit move the North Eastern Company had completely foiled the designs of their opponents.

* Evidence of J. Hodgson Hinde on the Newcastle, Derwent and Weardale Railway Bill, 27th May and 18th July, 1861.

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PLATE XXXIII.



W. E. Miller, pinxt.

Harry Stephen Thompson—Chairman, 1855-1874.

The Stockton and Darlington Board, with the concurrence, no doubt, of the North Eastern authorities, put out a cautious feeler to ascertain whether the West Hartlepool Harbour and Railway Company would entertain the idea of an amalgamation with their Company, and on the 13th of April, 1860, Mr. Ralph Ward Jackson submitted to the Darlington Board a memorandum of his views as to the basis upon which the two Companies might equitably come to an agreement, but the negotiations seem to have stopped short at this point.†

After the Stockton and Darlington defection the case of the Newcastle and Derwent Valley party necessarily collapsed. They could not show, as they proposed, an independent access into Lancashire, because the Stockton and Darlington and South Durham and Lancashire Union lines were closed against them; they could not show an independent access into Newcastle, because they had to go for three miles over the rails of the Newcastle and Carlisle Company who were hostile to them, and further, they could show no access to any shipping place on the River Tyne. The preamble of their Bill was therefore declared not proved. The North Eastern Railway Company's Derwent Valley Bill shared the same fate.

The North Eastern and Newcastle and Carlisle Railway Companies' Amalgamation Bill, which came before the Committee immediately afterwards, was strenuously opposed by the North British Company and their allies. They succeeded in creating no little prejudice against the Bill by giving a somewhat distorted view of the arrangement under which the Newcastle and Carlisle Company had closed their line to the Newcastle and Liverpool traffic. Though the evidence given in favour of the Bill showed that the public, as well as the Companies themselves, would derive benefit from the amalgamation of the two lines, it failed to obliterate the impression produced on the minds of the Committee by the disclosure of the payment of "Black-mail" as it was called or compensation for the diversion of traffic, and they declared the preamble not proved. The Lancaster Valley branch (extension of time) Bill passed the House of Commons, but was rejected by the House of Lords. The three Bills promoted by the North Eastern Company were thus lost.

Of the eight Bills against which they appeared as petitioners seven were opposed successfully. The eighth Bill, viz., that for uniting the Border Counties line with the North British system, was passed, the acquiring

† Minutes of Evidence on Stockton and Darlington, South Durham and Lancashire Union and Eden Valley Railway Company's Amalgamation Bill, 7th June, 1861.

Company obtaining running powers over a mile of the Newcastle and Carlisle Railway from the point of junction to Hexham Station, and facility clauses as regarded the line from Hexham to Newcastle. Reciprocal facilities from all stations between Newcastle and Hexham to all stations on the Border Counties Railway were granted to the Newcastle and Carlisle Railway Company. The Carlisle and Silloth Bay and Port Carlisle Companies also obtained running powers over the Canal branch to the London Road Station at Carlisle.

With powerful supporters in the background, the promoters of the Derwent Valley scheme were not disposed to allow the rejection of their Bill and the understanding between the Stockton and Darlington and North Eastern Companies to discourage them. They immediately brought out another and larger scheme—the Newcastle, Derwent and Weardale Railway—which did give an independent access to Newcastle and to a shipping-place on the Tyne and which was also independent of the Stockton and Darlington Company. Commencing at Newcastle by a junction with the Newcastle and Carlisle Railway and at Gateshead, at the New Quay, the proposed line proceeded by way of Redheugh and Dunston to Swalwell, then along the Derwent Valley to Consett and thence by way of Tow Law and Bishop Auckland to the South Durham and Lancashire Union line near West Auckland; throwing off branches to join the North Eastern Railway at Gateshead, the Newcastle and Carlisle Railway at Derwenthaugh, the Stockton and Darlington at Hownes Gill and Bishop Auckland and the Byers Green branch of the West Hartlepool Harbour and Railway Company near Merrington Colliery. By connecting their line with the West Hartlepool system they secured the zealous co-operation of a company, not only traditionally opposed to the Stockton and Darlington Company, but actually at variance with the North Eastern Company on the question of the diversion of North Yorkshire and Cleveland traffic from the West Hartlepool to the Stockton and Darlington and North Eastern lines.

As the North British and London and North Western Companies appeared as subscribers to the extent of two-thirds of the share-capital and had two members each on the provisional committee, it was obvious who were the real promoters of the Newcastle, Derwent and Weardale scheme. The strained relations which existed between the North British and North Eastern Companies will account for the support of this scheme by the North British Company, but what were the London and North Western Company doing in this galley? Their object was to force the North Eastern Company to modify the

traffic arrangement under which the traffic between Newcastle and Liverpool was carried round by Normanton. To their repeated applications for through rates by way of Leeds the North Eastern Company had turned a deaf ear, hence "the necessity," as the chairman of the London and North Western Company explained, "of promoting the line to the Derwent Valley."

In addition to getting access to Newcastle, the London and North Western Company proposed to secure a footing at West Hartlepool and, in a traffic bill promoted by the West Hartlepool Company who sought running powers over portions of the North Eastern, Stockton and Darlington and Lancaster and Carlisle Railways and over the whole of the South Durham and Lancashire Union and Eden Valley lines there were clauses to enable the London and North Western Company to purchase lands and build warehouses at West Hartlepool and to acquire an interest in the West Hartlepool Harbour and Railway to the extent of one-fourth of the share-capital.

North British influences seem to have been at work in the inception of a scheme for a line of railway from Hexham to Skipton which was intended to touch the Stockton and Darlington Railway at Stanhope, the South Durham and Lancashire Union Railway at Barnard Castle, the North Eastern Railway at Leyburn and the Midland Railway at Skipton and to form, in conjunction with the Border Counties Railway, a central line from the manufacturing districts of Yorkshire and Lancashire to Edinburgh.† It was no doubt in a spirit of friendly co-operation with the North British Company that the chairman of the Blyth and Tyne Company, Mr. Joseph Laycock, proposed an extension of their railway to Newcastle. By the opening, on the 31st of October, 1860, of the line between the Dairy House and North Shields, a port with which it was considered important to have a direct communication was made accessible to the North British Company as soon as the Wansbeck Valley line should be completed.

Now while the London and North Western, the North British and the West Hartlepool Companies were combining their efforts to promote the Newcastle, Derwent and Weardale scheme, the Great Northern Company were joining hands with the South Yorkshire Company to support a scheme for making a line from Thorne to Staddlethorpe in order to get a readier access to Hull, and the Midland Company were preparing to go to Parliament for powers to enable them to cross the ridge between Airedale

* *Herapath's Railway Journal*, 1861, page 213.

† *Darlington and Stockton Times*, August 25th, 1860.

and Wharfedale and occupy a district which the North Eastern Company had already surveyed for a branch line.*

The situation which confronted the North Eastern directors in the autumn of 1860 was an extremely difficult one. The campaign opened with an attempt to detach the West Hartlepool Company from the other opposing interests by a proposal of amalgamation. The West Hartlepool Company were willing enough to treat with the North Eastern Company, but the state of their financial affairs placed them at a great disadvantage in the discussion of terms. A series of attacks upon the management by Benjamin Coleman, a member of the London Stock Exchange, with the avowed object of discrediting the chairman, followed by an investigation of the affairs of the Company by a Committee of Assistance, had drawn attention to a number of irregularities on the part of the directors, and it was now established that bonds had been issued largely in excess of the legal powers of the Company, that money had been expended on objects other than those authorised by the Company's Acts of Parliament, and that the accounts had been presented in such a form as to conceal these transactions from the shareholders.

These irregularities dated from 1848 when George Hudson, having obtained Parliamentary sanction to the leasing of the Hartlepool Dock and Railway and Great North of England, Clarence and Hartlepool Junction line, acquired a preponderating interest in the West Durham Railway by the purchase of £27,000 worth of shares. Mr. Jackson and his colleagues could scarcely doubt that attempts would be made to abstract the Collieries from which the West Hartlepool Company derived the greater part of their traffic, and, in order to bind these collieries to the West Hartlepool system, they had resorted to the dangerous expedient of making pecuniary advances to the owners and giving them credit for arrears of dues. Mr. Jackson had even taken upon himself the responsibility of purchasing certain collieries when it seemed not unlikely that they would fall into the hands of parties connected with rival interests. Rightly conceiving that the establishment of a regular shipping service between West Hartlepool and the ports of Northern Europe would stimulate the development of the Company's goods traffic, the Board had employed the Company's funds in the purchase of steamboats which traded with Hamburg, Rotterdam and

* A rupture with the Midland Company was averted by the good sense of the two Boards who agreed that the piece of railway from Milner Wood to Ilkley which was common to both schemes should be constructed as a joint line.



Daguerreotype by Claudel.

RALPH WARD JACKSON.

Engraved by J. Brown.

Cronstadt. Money was obtained for the carrying out of these defensive measures by the issue of bonds to an extent not authorised by the Company's Acts of Parliament, the directors, however, believing that the collieries and steamboats afforded an adequate security for payment of the interest and ultimately for repayment of the principal of the moneys advanced. These transactions, though for the benefit of the Company, had necessarily to be kept secret. To have brought them under the notice of the shareholders would have been to have placed the Company's plan of defence in the hands of competing railway and dock companies.

The report issued by the Committee of Assistance after the most careful investigation of the accounts was practically an approval of the acts of the directors which, though censurable from the strictly legal standpoint, had yet achieved the object in view—the preservation of their traffic, and by increasing the trading facilities, made West Hartlepool one of the first ports upon the east coast. At the suggestion of the Committee of Assistance, the collieries were formally transferred to the Company on the 23rd of February, 1860, by Mr. Jackson, in whose name they had previously been held, and the Company then went to Parliament with a Bill to effect a division of their capital and debt into railway capital and debenture debt, and harbour and docks capital and debenture debt, to increase the amount of authorised share and loan capital from £2,686,000 to £3,400,000, and to confirm the mortgages and bonds already issued by the Company “in anticipation of such increased loan powers,” etc. The bill, however, did not, come before the Committee of the House of Commons, the promoters deciding to withdraw it in face of a significant report from the Board of Trade which pointed out that, while liabilities had been incurred in excess of statutory powers, no extension of the railway or harbour was proposed to be authorised by the Bill, and that the Company applying for these increased borrowing powers had for some years had a large amount of unexhausted share capital. Meanwhile Benjamin Coleman, one of the petitioners against the Bill, had appealed to the Court of Chancery for an injunction to restrain the Company from holding collieries or steamships and from making or continuing loans to the owners of collieries or steamships and from issuing any debenture, loan-note or security until the liabilities of the Company had been reduced within the Parliamentary limits; but important though it was to upset a dangerous combination, the North Eastern Board would hardly have been justified at this time in offering very liberal terms to the West Hartlepool Company.

The West Hartlepool Company, on the other hand, were not prepared to tear up their agreements with the London and North Western Company without substantial reasons. The result was a deadlock and the negotiations, like those of 1857, came to nothing.*

Preparations were then made for the Parliamentary campaign of 1861, notices being given of applications for leave to bring in the following measures: a Bill for the amalgamation of the Newcastle and Carlisle and North Eastern Companies, a Bill for the amalgamation of the Stockton and Darlington, the South Durham and Lancashire Union and Eden Valley Railway Companies, and a Bill for the construction of a line from Blaydon to Consett. No Bill was deposited for the amalgamation of the North Eastern and Stockton and Darlington Companies, but the arrangement which had been made between the two Companies for the interchange and division of traffic came into force on the 1st of January, 1861. As objections had been taken, both in a Court of Law and in Parliament, to the arrangement for closing the Newcastle and Carlisle line to traffic between Newcastle and Liverpool, it was terminated and the route by Silloth and Whitehaven thrown open again.

In the North of England a good deal of preliminary skirmishing had taken place. The chief organizer of the opposition to the North Eastern Company was Mr. Edward Glynn, of the firm of Laws, Glynn and Mason, who acted as the professional advocate of North British interests in Newcastle. By his pen and tongue he was almost ubiquitous, denouncing the North Eastern and Newcastle and Carlisle amalgamation and extolling the merits of the Newcastle, Derwent and Weardale scheme.† In spite of this agitation the public remained comparatively unmoved by the outcry of "monopoly."

If the three confederate companies expected that a diversion would be made in their favour from the south, they were doomed to disappointment; for the North Eastern directors got into touch with the promoters of the Hull and Doncaster scheme and induced them to withdraw their Bill on the understanding that the North Eastern Company would bring in a Bill of their own in the following session. The Newcastle, Derwent and Weardale scheme, which comprised a branch to the newly built quay at Gateshead, came before Parliament on the 24th of May, 1861. It had the effect of bringing to a head negotiations which had been proceeding for

* R. W. Jackson's evidence, Newcastle, Derwent and Weardale Railway Bill, 1861.

† *The Dangers of the North British Railway Policy*, by J. Baxter Langley, 1861, pp. 7 and 8.

some time between the North Eastern Company and the Gateshead Corporation with respect to a branch line down to the Quay from the Oakwellgate goods station—intended as a substitute for the authorised Quayside branch at Newcastle.

The results of the Parliamentary campaign of 1861 in the House of Commons were not favourable to the North Eastern Company. The Bill to enable the Blyth and Tyne Company to extend their railway to Newcastle and to make a number of other lines, viz., from Hotspur place (Shiremoor) to Monkseaton, from South Gosforth to Lough Bridge near Butterlaw, from Holywell to Monkseaton, from Seghill to the Seaton Burn waggonway, from Bothal Demesne to Newbiggin, and from their line at North Shields to proposed docks at the Low Lights and to Tynemouth was passed on the 1st of May. On the 10th of June the Bill for the amalgamation of the Stockton and Darlington, South Durham and Lancashire Union and Eden Valley Companies was rejected and, on the 21st of June, contrary to general expectation, the preamble of the Newcastle, Derwent and Weardale Bill, after nineteen days of investigation, was declared proved by the House of Commons, the Blaydon and Consett Bill of the North Eastern Company being thrown out. On the 24th of June the North Eastern and Newcastle and Carlisle Amalgamation Bill was withdrawn "in consequence of the lateness of the session and the protracted inquiry that was likely to ensue."

The next passage of arms took place in the House of Lords, before a committee of which the North Eastern Company hoped to be able to reverse the decision of the Commons. Interest in the struggle was forcibly shown by the crowded state of the committee room. All that could be said against the North Eastern Company was said, and it was noted at the time that not a single coal owner except Mr. Nicholas Wood, who was closely connected with the West Hartlepool interests, had a single word of complaint to make against the North Eastern Company. The witnesses for the opposition had no difficulty in showing that the new route from Newcastle to Liverpool—a single line for 63 miles with exceedingly bad gradients—was vastly inferior to that by way of Normanton, and that for local purposes an independent company was not desirable. An expression of opinion from the chairman of the committee that the case of the promoters had not been shaken by cross-examination, was construed by the Newcastle, Derwent and Weardale party into a plain intimation that the preamble of the Bill would be voted, and they were, in consequence, much elated. Their

opponents, however, though crestfallen, went doggedly on with their case, and so thoroughly convinced the committee by the evidence adduced that, on the 27th of July, they threw out the Bill. "The promoters," wrote Mr. Mewburn in his diary, "could scarcely believe their ears when they heard the decision. So confident were the engineer and solicitor of the Bill that each took his wife and children to hear the preamble duly proved."* Once more the North Eastern Company had succeeded in driving back the invaders of their district, but at a cost of £37,000.†

With regard to the legislation affecting the West Hartlepool Company, Parliament had refused to grant running powers over the lines which linked the West Hartlepool with the London and North Western system, to legalise the debts and liabilities incurred in connection with the collieries and steamboats, to sanction the holding of these steamboats, to authorise further contributions to the Cleveland Railway Company, and to allow the London and North Western Company to purchase and hold property at West Hartlepool and to take shares in the West Hartlepool Company to the extent of one-fourth of the capital. It had, however, given traffic facilities to the Company over the Stockton and Darlington, South Durham and Lancashire Union and Eden Valley railways and provided for the regulation and enlargement of the capital.

The Frosterley and Stanhope Railway Company, the smallest of the railway companies merged in the North Eastern Company, obtained their act of incorporation this session—23 and 24 Vic., cap. 72, 28th June, 1861,‡ by which they were empowered to make a railway only $2\frac{1}{4}$ miles in length, from Frosterley to Newlandside, near Stanhope, virtually an extension of the Wear Valley Railway. They were authorised to raise a capital of £10,000 in shares and £3,000 by loan, and to make working arrangements with the Stockton and Darlington Company, under whose auspices the railway had been projected.

By another act passed this session, the Stockton and Darlington Company were authorised to subscribe £25,000 towards the construction of the Cockermouth, Keswick and Penrith Railway, which, by connecting the Eden Valley and Cockermouth and Workington Railways, made a new route

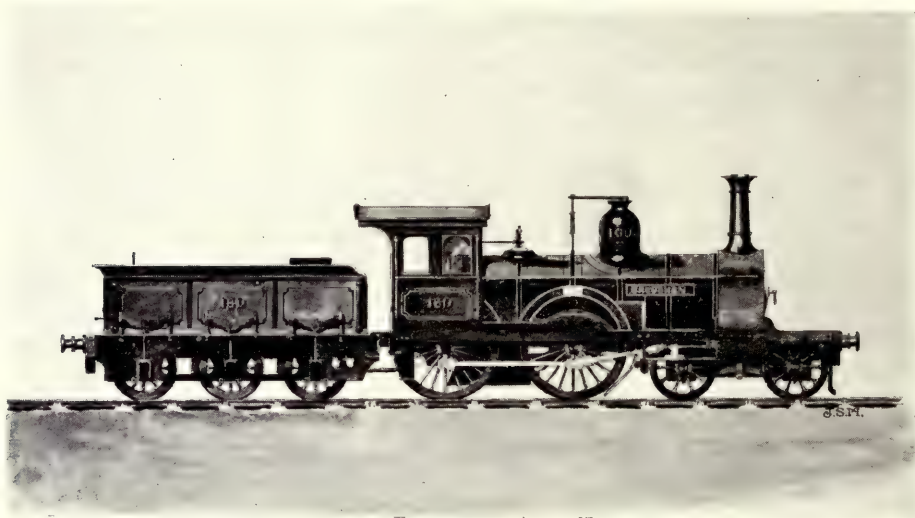
* *Larchfield Diary*, p. 167.

† H. S. Thompson at Half-yearly Meeting, August 18th, 1865. *The Railway Times*, 1865, p. 1,110.

‡ Directors appointed by the Act—Peregrine George Ellison, Alfred Kitching, Henry Pease, Archibald Gilchrist Potter, Robert Thomas, and John Anthony Woods. First Chairman: Henry Pease.

available for the transmission of coke from the neighbourhood of Bishop Auckland to Workington and of hæmatite iron-ore from that district of Cumberland to the blast furnaces of Middlesbrough, Eston and Port Clarence.

On the 7th of August, 1861, the line which had been the cause of so much railway rivalry—the South Durham and Lancashire Union Railway—was formally opened. A portion of the line, between Barnard Castle and Barras, a distance of 16 miles, had been opened for mineral traffic on the 26th of March, 1861, and the remaining portion between Barras and Tebay on the 4th of July. The general opening took place on the 8th of August, 1861,



THE "BROUGHAM" ENGINE.

when the passenger service consisted of two trains a day in each direction. The new line was a single one running through a wild moorland district broken by deep gorges. In passing over Stainmore it reached an altitude of 1,378 feet above sea-level. Two powerful engines—the "Brougham" and the "Lowther"—had been built in 1860 by Messrs. R. Stephenson & Company to work the traffic over the heavy gradients of this line which, between Barras and Kirkby Stephen, were as steep as 1 in 60 and, on Stainmore, 1 in 67.5. Each of these engines had outside cylinders 16 inches in diameter by 24 inches stroke, four coupled driving wheels, 6 feet in diameter each, preceded by a four-wheeled bogie, and a boiler 10 feet 6 inches in length con-

taining 176 iron tubes which, with the firebox, gave 1,128 square feet of heating surface. They were the first bogie-engines employed on the North Eastern Railway and the first engines on the same railway furnished with cabs for the protection of the driver and fireman. The principal engineering features of the railway were the viaducts which carried the line over the gorges of the mountainous district lying between Barnard Castle and Tebay. The most remarkable of these were the Beelah, Deepdale and Tees viaducts each of which consisted of a lattice girder superstructure of wrought-iron and abutments and foundations of stone. In the case of the Beelah and Deepdale viaducts, the superstructure rested on cast-iron columns braced together by cast-iron struts and wrought-iron tie-bars; in the case of the Tees viaduct, it rested on stone piers.

The following table gives the principal dimensions of these viaducts which were all designed by Mr. (afterwards Sir) Thomas Bouch:—

	Length. Feet.	Greatest Height. Feet.	Width between Parapets. Feet.	Number and Width of Spans in Feet.	Cost. £
Beelah	1,040	196	24	16 of 60	31,630
Deepdale	740	161	24	11 of 60	20,687
Tees	732	132	24	2 of 21 } 5 of 60 }	25,119

Iron was selected as the material of these viaducts on account of the rapidity with which structures of this material could be erected. The viaducts which carried the railway over the Percy Beck, the Mouth gill, the Ayle gill, Merry gill, Pod gill and the Smardale ravine were of stone, the largest being the Smardale viaduct, 553 feet in length and 90 feet in extreme height, consisting of 14 arches of 30 feet span each.*

The opening of this railway completed the connection between West Hartlepool and Lancashire, and it was generally expected that the London and North Western Company, who had purchased the whole of one side of a dock, with the warehouses upon it, from the West Hartlepool Company for £100,000, would renew their attempt to obtain a legal footing in the port. On the 13th of January, 1862, a railway communication between West Hartlepool and Hartlepool, which had been broken in 1845, was renewed by the opening for passenger traffic of a short connecting-line laid on piles over the south-east portion of the Slake and passing through Middleton.†

* *South Durham and Lancashire Union and Eden Valley Railway Companies—Summary of Facts and Expenditure*, by George Brown, 1863.

† The line was tested and approved for goods and mineral traffic on the 5th of April, 1860. *Stockton and Hartlepool Mercury*, April 7th, 1860.



From a photograph taken in 1858.

DEEPDALE VIADUCT IN COURSE OF CONSTRUCTION.

Meanwhile the affairs of the West Hartlepool Company were going from bad to worse. The limitation of the borrowing powers by the Capital Act of 1861 to £700,000 made some of the debenture holders uneasy as to the validity of their securities. At the suit of the Northern Assurance Company, holders of debenture stock to the amount of £38,000, an injunction was granted by the Court of Chancery in February, 1862, restraining the directors from paying away any moneys belonging to the Company until the Court had taken action in the disposal of the assets amongst the creditors, and Mr. W. S. Leng, the traffic manager of the Company, was appointed receiver on behalf of the Court. On the nomination of a committee of debenture holders, Messrs. Quilter, Ball & Company were then instructed to examine and report on the financial condition of the Company. A new body of directors was formed, consisting of five of the bondholders, together with two members of the old board—Ralph Ward Jackson and Robinson Watson. On the 1st of March, 1862, the new board suspended payment of all interest accruing due to the debentures. At this time the amount of the Company's debentures overdue and unpaid was upwards of £126,000. One of the bondholders having taken proceedings at common law and obtained a judgment against the Company for an overdue bond, the engines, carriages and other property of the Company were seized in execution by the sheriff. The whole of the Company's property was then made over by a deed of assignment to the manager appointed by the Court as a protection against the claims of individual bondholders.*

Mr. Ball's report showed that while the total amount of share and loan capital authorised by the Company's acts was £2,800,000, the amount raised and expended was £3,733,393. Of this amount about £2,750,165 represented the cost of the harbour and dock works, warehouses, railways and rolling stock, etc., and £983,228 the value of the surplus lands, collieries, steamboats, shares in other companies, substantial assets capable of being realised without affecting the Company's general works. Before bringing the amount standing at the debit of the accounts of the collieries and steamboats to the credit of the balance sheet, Messrs. Quilter, Ball & Company had deemed it necessary to write off large sums for loss and depreciation, viz., collieries, £271,210; steamboats, £34,283; total, £305,493. The most startling fact brought to light by Mr. Ball's report was the enormous amount of debentures

* *The Past and Present Position of the West Hartlepool Harbour and Railway Company*, 1862, p. 28.

and debenture debt in existence at the 31st of December, 1861, viz., £2,744,686. As the total amount of share capital raised at this date was only £988,708, the loan capital in conformity with the usual Parliamentary restriction ought not to have been more than £329,569. This amount had been exceeded by £2,415,117. It must be added, however, on behalf of the directors that the various acts defining the Company's capital powers, both prior and subsequent to the Amalgamation of 1853, were capable of a greater latitude of construction than the West Hartlepool Financial Act of 1861, which rigidly fixed the proportions of the Company's share and loan capital. The statement of the revenue account of 1861 revealed an alarming condition of affairs. The profit on the working of the railway and docks for the year was £65,519 subject to a deduction for bad debts, steamboat depreciation and losses incurred in the trading of the vessels and the working of the collieries. A balance of £14,628 was all that remained to meet the various preferential charges and debenture interest, which, together, amounted to £168,224; the final embarrassing result being a net deficiency on the revenue account for the year of £153,596. Mr. Jackson's position as a member of a Board elected for the purpose of retrieving the consequences of his own errors of judgment was no longer tenable, and, in April, 1862, he resigned.

Attention was now drawn to the affairs of the Cleveland Railway Company which stood so closely related to the West Hartlepool Harbour and Railway Company, and other irregularities came to light. It was ascertained that no calls had been made on the shareholders; that, with the exception of about £13,500 prepaid by three or four of the larger proprietors, the whole of the money spent had been advanced by the West Hartlepool Company or raised on debentures to an extent unauthorised by the Company's acts. Some of the shareholders repudiated any liability to meet calls on the strength of a guarantee given to them, when signing the subscription contract, that they should be indemnified out of the funds of the West Hartlepool Company. These disclosures led to the retirement of Mr. Jackson from the chair, and soon afterwards from the Board of the Cleveland Railway Company.

The fall of Ralph Ward Jackson corresponded in many respects with that of George Hudson. Both men, in relinquishing the positions which they had gained by the exercise of so much constructive energy and administrative skill, took an irrevocable step. The power they abdicated, they never regained. In the case of each, the crisis was followed by a long course of vexatious litigation ending in "evil days." In considering this crisis in the affairs of the West

NORTH EAST COAST OF ENGLAND

1859



Hartlepool Company we shall avoid doing injustice to the memory of an admittedly great man by giving due weight to the report of the Committee of Assistance,* and the affidavits of Mr. Thomas Sturge,† a shrewd retired merchant of unimpeachable integrity, who spent nearly a year in going through the accounts of the Company. Mr. Sturge, while attributing some errors of judgment to Mr. Jackson, acquitted him of any dishonourable motive in overstepping the limits of the West Hartlepool Company's borrowing powers. He was satisfied that the affairs of the Company had been honestly and disinterestedly administered; that the money expended was abundantly represented by valuable and sufficient property; that, setting aside any legal view of the question, it was practically immaterial how the funds of the Company had been raised, inasmuch as they had been honestly expended for the benefit of the Company; that the outlay on the collieries had been necessary for the protection of the Company against competing companies who might, and otherwise would, have obtained possession of the collieries. That Mr. Jackson, as an eminent Queen's counsel expressed it, "had been led by his zeal for the Company to do many things irregularly" must be frankly admitted; but that, in exceeding the legal limits of his function as a director, he acted with any fraudulent intention, for his own personal advantage, can scarcely be maintained after the declaration of the chairman of the Committee which sat on the Bill of 1861 and the verdict of the jury which tried the case of *Jackson v. Leeman* in 1874. Whether Mr. Jackson were justified in forcing the trade of West Hartlepool by the establishment of a line of steamboats, in preserving the revenue of the Company by an expedient so dangerous as the making of advances to the collieries, and in securing surplus lands for future development by pledging the credit of the Company to an unauthorised extent, are questions upon which there will necessarily be differences of opinion. West Hartlepool, however, remains a monument to his foresight and enterprise. Where in 1844 there was an open beach skirted by sandhills and, behind this desert ridge, an open agricultural country with a solitary farmhouse and windmill as the only marks of human life and industry, Ralph Ward Jackson left in 1862 a spacious harbour, 44 acres in extent, three deep water docks with an aggregate area of 32 acres, two large graving docks, a timber dock and timber ponds covering a water area of 24 acres and timber yards of upwards of 20 acres, warehouses comprising

* *Present Financial and Commercial Position of the West Hartlepool Harbour and Railway Company*, p. 33.

† *Railway Times*, March 2nd, 1861.

a floor area of 13 acres, and upwards of 25 miles of railway laid down for traffic approaches and accommodation to the docks, and a growing town with a population of 16,000 inhabitants.

The directors of the new West Hartlepool Board who took office in 1862 under the chairmanship of Henry Robertson Sandbach were confronted by a combination of adverse circumstances. There was a depression in the coal trade at the time and a general disturbance in commerce throughout the country occasioned by the Civil War in America. They succeeded in getting rid of the fleet of screw steamers at a very considerable sacrifice, disposing of them to Messrs. Pile, Spence & Company, a shipbuilding firm of West Hartlepool upon terms which afforded a guarantee that the communication with Hamburg, Rotterdam and the Baltic would be efficiently maintained; but offers for the collieries were so far below the value placed upon them that it was decided to retain them until there should be an improvement in the state of the coal trade. Realising how hopeless it was to attempt to retrieve the financial position of the Company without a Parliamentary re-arrangement of the capital, they proposed to bring in a Bill to authorise the conversion of the debenture debt into stock entitled to 3 per cent. preference dividend. By means of this financial measure the debenture holders would secure a definite and recognised position, with a voice in the management of the Company, as first preference stock holders. The directors would then be able, in accordance with the ordinary rules of Parliament, to borrow money in respect of such stock as well as in respect of the existing share capital, to the extent of one-third of the aggregate amount thereof, for the purpose of paying off the prior charges. Some of the preference shareholders, mortgagees and older bond holders with legal priorities objected to this scheme of settlement; and not the least difficult part of the directors' task consisted in reconciling conflicting claims with the view of avoiding litigation.

The new Cleveland Board, on taking office in May, 1862, found the affairs of the Company in a tangled state owing to the mode in which some of the debentures issued had been negotiated. Many of these they succeeded in getting cancelled, others they redeemed from their own private resources in order to bring the loans within the Parliamentary limits; and, by making calls on the shareholders, they secured funds to enable them to resume the construction of the railway towards Boosbeck Lane.

To the difficulties which beset the West Hartlepool Harbour and Railway Company at this time must be ascribed the absence of much of the opposi-



From a photograph taken about 1858.
TEES VIADUCT, SOUTH DURHAM AND LANCASHIRE UNION RAILWAY.

tion which would otherwise have been directed so pertinaciously against the Stockton and Darlington and North Eastern Railway Bills of 1862. All the Bills of these Companies which had been rejected or withdrawn in 1861 were passed in 1862. The Stockton and Darlington amalgamations, sanctioned by an Act which received the royal assent on the 30th of June, 1862, embraced not only the South Durham and Lancashire Union and the Eden Valley Companies, but also the little Frosterley and Stanhope Company who had, during the same session, obtained authority to vary the course of their line near Stanhope with the view of obtaining a more convenient site for a passenger station near the east entrance of that town, the limestone quarries at Newlandside being reached by a branch from the deviated line. In order that a connection might be made between the Eden Valley and the Cockermouth, Keswick and Penrith Railways, it had been arranged that the former railway, instead of bending southward towards Clifton Station, should be carried forward from Wetheriggs in a north-westerly direction towards Clifton village, and an agreement having been made with the London and North Western Company for running powers over their line to Penrith from the new point of junction, an Act was obtained this session to sanction the extension and confirm the arrangement. Powers were obtained by the Stockton and Darlington Company for making a line between Tow Law and Crook in substitution of the existing railway over Sunnyside incline, rendering it possible to convey traffic all the way between Newcastle and Tebay by locomotive engines.

When the North Eastern and Newcastle and Carlisle Amalgamation Bill appeared for the third time before Parliament, it was confronted with a formidable array of fourteen petitions. The same powerful influences which had blocked the progress of the Bill in former sessions were again marshalled against it, and it would, in all probability, have been rejected in 1862 had not the North Eastern directors secured the withdrawal of the leading opposition by means of agreements based on the principle of the open route. They conceded running powers to the North British Company from Hexham to Newcastle, obtaining in return similar powers between Berwick and Edinburgh, and they granted increased facilities to the London and North Western Company at Carlisle and other places on the North Eastern system, provision being made for the carrying of their own traffic into the London and North Western system. No sooner had these companies secured clauses to protect their traffic than the whole of the opposition disappeared, with the

exception of one solitary petitioner, who was defeated, and the long-impeded Amalgamation Bill became law, receiving the royal assent on the 17th of July, 1862. The Act authorising the amalgamation ratified an agreement with the Caledonian, Lancaster and Carlisle, and London and North Western Companies for the admittance of the North Eastern Company into the Citadel Station at Carlisle. The Hull and Holderness Railway, which had been worked by the North Eastern Company since the 1st of January, 1860, at a rental of $3\frac{1}{2}$ per cent. in 1860 and 1861, and 4 per cent. in 1862, was now united with their system by a formal Act of Parliament, powers being also obtained to form a short connecting curve between the Holderness line and the Company's Victoria Dock Branch.

No competing line through the Derwent Valley was promoted this year, and the North Eastern Company's Bill for a line from Blaydon to Consett passed almost unchallenged. The Company also obtained a renewal of the powers which had been granted to the York, Newcastle and Berwick Company in 1848 for the making of a line through the Team Valley from Gateshead to a point on the Bishop Auckland branch, north of Durham, being part of a scheme for improving the main line. The other part of the scheme, consisting of a line from a point on the Bishop Auckland branch, south of Durham, to a point on the old Newcastle and Darlington line, near Cassop, was abandoned this session owing to the opposition of one of the landowners. The Team Valley line completed a much better "alternative route to Liverpool" than that of the Newcastle, Derwent and Weardale scheme, and practically closed the last remaining avenue of approach to Newcastle against rival interests.

For some time there had been an agitation for additional railway facilities in the Hull district, and the North Eastern Company found it necessary to bring in two Bills with the object of strengthening their position in that district. One was for a renewal of powers previously possessed by the York and North Midland Company for the making of a line between Market Weighton and Beverley—the local supporters of the line having engaged to raise £40,000 in North Eastern 4 per cent. stock towards the cost of its formation, and to obtain the consent of the principal landowners to sell the requisite land at its agricultural value; the other was for a line from the Hull and Selby Railway near Staddlethorpe to the Great Northern Railway near Askern, which came into conflict with three other lines—the Hull and West Riding Junction Railway (promoted by an inde-

pendent Company), the South Yorkshire Company's Hull extension, and the Doncaster, Goole and Hull junction line of the Lancashire and Yorkshire Company. The Hull and West Riding Junction Bill was withdrawn at an early stage for want of adequate support, and the promoters of the three other schemes entered into a fierce Parliamentary contest, which lasted two months and cost them over £100,000. The North Eastern Company won the fight in the House of Commons, but their Bill was opposed in the House of Lords and rejected, it is said, by a casting vote. One of the schemes opposed by the North Eastern Company and also by the Lancashire and Yorkshire Company without success was the West Riding, Hull and Grimsby Railway—a line from Wakefield to Barnby Dun promoted in the interests of Grimsby and calculated to withdraw traffic from Hull.

A new Company, which had been formed in the autumn of 1861, was incorporated this session for the purpose of forming a line between Wilming-ton and Hornsea. Two other lines had been projected in 1861 in competition with this scheme—the Beverley and Hornsea and the Hedon and Aldborough, but neither of them came before Parliament. The Hull and Hornsea Act (25 and 26 Vic., cap. 100, 30 June, 1862)* was obtained at the small cost of £1,740, including all the preliminary expenses, there being no opposition. The length of the line sanctioned was 13 miles and the capital authorised was £70,000 in shares and £23,000 in loans. Power was granted to enter into working or traffic arrangements with the North Eastern Railway Company. The first sod of this line was cut on the 8th of October, 1862.

The amalgamations of 1862 added 59 miles to the Stockton and Darlington system and 96 miles to the North Eastern system. The Eden Valley and Frosterley and Stanhope Railways were only opened this year, the former for mineral traffic on the 12th of April and for passenger traffic on the 7th of June; the latter for mineral traffic as far as West Ferryfield House, near Newlandside, on the 30th of April, and for passenger traffic to Stanhope (old station) on the 22nd of October. The works on the Eden Valley Railway were very much lighter than those on the South Durham and Lancashire Union Railway. Of these works the most interesting were the Skygarth and Musgrave viaducts—examples of wrought-iron girder bridges, with cellular compression flanges of cast iron; the first consisting of four spans of 98·3 feet each; the other of three spans of 63 feet each.

* Directors appointed by the Act: Samuel Hall Egginton, Thomas Haller, Benjamin Haworth, William Wright, Joseph Armytage Wade. First chairman: Joseph Armytage Wade.

Several new lines were opened this year—1862—forming important connections and filling up gaps in the North Eastern system, viz., the Nidd Valley branch from Harrogate to Pateley Bridge ($11\frac{1}{2}$ miles) on the 1st of May; the Harrogate loop from Pannal Junction to Crimble Junction and from Brunswick Junction to Bilton Junction, with a spur towards Starbeck ($4\frac{3}{4}$ miles), on the 1st of August; and the Lanchester Valley line from Relly Mill to Consett (12 miles) on the 1st of September. A new station was opened at Harrogate, superseding the old Brunswick station which, together



KNITSLEY VIADUCT, LANCHESTER VALLEY BRANCH.

with a mile of railway, was soon afterwards abandoned. The Ayton branch, though completed this year, was not opened until the 1st of June, 1864.

Both the North Eastern and the South Yorkshire Company had profited by the experience of the last session and come to an agreement, with the concurrence of the Manchester, Sheffield and Lincolnshire Company, under which the South Yorkshire Company were to withdraw their Bill and the North Eastern Company to construct, if authorised,* the line between Staddlthorpe and Thorne; the understanding between the two Companies being that the South Yorkshire Company should have running powers for coal

* An Act was obtained by the North Eastern Company for the construction of the line on the 23rd July, 1863.

traffic from Thorne to Hull, and that the North Eastern Company should have similar powers for traffic of all descriptions over the South Yorkshire line between Thorne and Doncaster and, in certain contingencies, between Doncaster and the South Yorkshire collieries. The Lancashire and Yorkshire Company had also deposited plans for a similar line of railway, and early in 1863 the North Eastern and Lancashire and Yorkshire Companies came to a mutually satisfactory agreement for the transmission of the Hull traffic to and from the Lancashire and Yorkshire system by either the Goole or the Normanton route at the same rates, fares, and charges, with equal facilities and advantages. In respect to the Hull coal traffic the Lancashire and Yorkshire Company were to have the option of exercising running powers over the North Eastern line from Goole to Hull, while the North Eastern Company, in like manner, were empowered to run their trains between Normanton and Barnsley.

By means of the agreements which they had made with the promoters and abettors of invading schemes, involving the concession of through rates, rights of way, and facilities for the interchange of traffic, the North Eastern Company found themselves at the beginning of 1863 once more in a position of security, their district still intact and their system strengthened during the five years of defensive warfare by the addition of 175 miles of railway. No more favourable opportunity could have been desired for submitting to Parliament a Bill to authorise the amalgamation of the Stockton and Darlington and North Eastern Railway Companies. Had such a Bill been introduced either in 1860 or 1861 it would have met with a most unpromising opposition. As it was, a Bill which placed under the control of the North Eastern Railway Company a district extending from Saltburn to Tebay and Penrith in one direction and from Barnard Castle to Consett in another and added 200 miles of railway to their system was allowed to pass through both Houses of Parliament without obstruction. One of the clauses in the Bill provided that the joint net revenue of the North Eastern Company, which had hitherto been divided in accordance with the percentages fixed by their Act of 1854, should in future be apportioned as follows:—

Berwick Section	...	...	...	...	44·10	per cent.
York Section	...	...	...	...	25·41	„ „
Leeds Section	...	...	...	...	7·72	„ „
Malton Section	...	...	...	...	·29	„ „
Carlisle Section	...	...	...	...	8·58	„ „
Darlington Section	...	...	...	...	13·90	„ „

The Malton and Driffield section of the shareholders, who had been getting deeper and deeper into debt—their share of the joint net revenue never having been sufficient to meet the working expenses of their portion of the line—petitioned against the clause. Their objections, based upon a claim to gross instead of net revenue, could not be sustained, and the division of the joint net revenue in accordance with the proportions set out in the clause was sanctioned and fixed as from the 1st of July, 1863.

The West Hartlepool Company had lodged a petition against the Bill, but they withdrew their opposition on obtaining an arrangement for reciprocal facilities scheduled to the Bill. A clause was inserted at the instance of the Stockton Corporation to prevent the Company from abandoning the line of railway along the quays of that town. The arrangement by which the Stockton and Darlington system was to be managed separately for a period of ten years by a specially constituted Darlington Committee was confirmed and the Bill became law on the 13th of July, 1863. By another Act in the same session, dated 28th July, 1863, the North Eastern Railway Company were authorised to construct a branch connecting the North Eastern Railway with the Quayside at Newcastle, to which was scheduled an agreement with the Newcastle Corporation.

The West Hartlepool Harbour and Railway Company obtained an Act this session by which the whole financial constitution of the Company was remodelled in accordance with the scheme of the directors already outlined. This Act legalised the large amount of debenture debt which had been created in excess of the Company's powers, authorised the raising of additional capital, defined the Company's capital and borrowing powers, and regulated the future position *inter se* of the various classes of creditors and shareholders. Under the old constitution half a million of stock in shares had had control of two millions and a half in bonds. By the conversion of the debentures and bonds into paid-up consolidated stock of the Company, and the restriction of the borrowing powers to the usual Parliamentary limits, the financial position of the Company was re-established on a sound legal basis. It was required of the Company that they should dispose of their interest in collieries and coal royalties within five years. Authority was given to raise £100,000 for the purpose of recovering possession of the property conveyed *ultra vires* to the London and North Western Company.

The West Hartlepool Company had all but failed to get their Bill of Arrangement through Parliament. It was only from a consideration of the

extreme hardship which would be inflicted upon a number of innocent share and bondholders if the Company were driven into litigation to settle the conflicting claims occasioned by the over-issue of their debentures that induced the House of Lords, after Lord Donoughmore's committee had rejected the Bill and presented a special report upon the case—in effect an indictment, from *ex parte* statements, of Mr. Jackson and his co-directors—to recommit, and eventually to pass, the measure.

By another Act passed this session extending the time allowed for the completion of the Cleveland Railway and giving the Cleveland Company power to raise additional capital, the advances made by the West Hartlepool to the Cleveland Company in excess of their authorised subscription were sanctioned and converted into shares, the interest of the former Company in the capital of the latter being increased to £125,000.

The reconveyance by the London and North Western Company of the land and property sold to them by the West Hartlepool Company involved the abandonment of their plan for securing a footing at West Hartlepool. It is not, therefore, without significance that, at this very time, a new trunk line should have been projected from Leeds, by way of Wetherby and Easingwold, to Rosedale and Stockton, one of the objects of the scheme being to tap the North Yorkshire ironstone district from the south. Whether rightly or wrongly, the London and North Western Company got the credit of setting this scheme afloat.* There had already been a local agitation for lines from Helmsley to Kirbymoorside, and from Leeds to Wetherby which augured well for the success of the scheme.† Rival influences were also believed to have been at work in the promotion of a scheme for extending the Cleveland Railway southward from Skinningrove, along the coast to Scarborough, under the name of the “Scarborough, Whitby and Staithes Railway.” As this line, in conjunction with the Cleveland Railway, formed a competitive route to the north from the chief towns of the Yorkshire coast, it necessarily met with opposition from the North Eastern Company, who were at this time spending a quarter of a million sterling in the valley of the Esk for the completion of a direct line of communication between Whitby and the north and for the improvement of the existing line to the south and west by means of a considerable deviation.

* *Malton Messenger* quoted in *Railway Times*, November 14th, 1863.

† *Herapath's Railway Journal*, October 18th and November 8th, 1862; *Railway Record*, September 19th, 1863.

Two questions had been forced upon the attention of the North Eastern Board by the proposals of other Companies for new lines—the improvement of the East Coast route by the construction of a direct line between York and Doncaster and the improvement of the communication between York and Leeds by the cutting off of the angle formed by the old York and North Midland and Leeds and Selby lines and by the continuation of the latter railway through the heart of Leeds to a large joint station which it was proposed to erect. Plans were accordingly deposited in the latter part of 1863 for lines from Dringhouses to Askern and from Church Fenton to Micklefield and from Marsh Lane, Leeds to Holbeck. A Bill was also deposited for sundry short connecting lines between the North Eastern and Stockton and Darlington lines at Bishop Auckland and Haughton-le-Skerne and between the Lancaster and Carlisle and Cockermouth, Keswick and Penrith Railways near Dacre. The Bill for the Leeds extension was soon afterwards withdrawn in deference to public opinion, strong objections having been expressed by many of the inhabitants of the town to the disfigurement of the principal streets by a line of railway carried on arches across them in the direction proposed by the North Eastern Company.

The early months of 1864 witnessed the completion of the Hull and Hornsea line and the extension of the Blyth and Tyne Railway from Hotspur Place near Backworth to Newcastle, in one direction, and to Monkseaton in the other. The first line was opened on the 28th of March, 1864, and on the 1st of June, 1864, the Victoria Dock Branch having been doubled in view of this further connection with the seaboard, and a short connecting-line made between this branch and the Hull and Holderness Railway, the Hornsea and Withernsea traffic was worked into the Paragon station at Hull. The formal opening of the Blyth and Tyne extensions took place on the 22nd of June, 1864, the public opening on the 27th of that month. The Newcastle terminus of the Blyth and Tyne Railway was Picton House, built, like the Central Station, from the designs of John Dobson, but a quarter of a century earlier, on the west bank of the Pandon Dene. The Tynemouth extension of 1860 had stopped short near the Master Mariners' Asylum at North Shields, but it was now being carried forward to a more suitable termination near the North Eastern station at Tynemouth, from which it was only separated by the turnpike road. As the Blyth and Tyne Company charged the same fares to Tynemouth as the North Eastern Company, the new line was extremely well patronised, 17,000 passengers, mostly of the third class, being carried during the first week.

In Parliament the North Eastern Company carried all their Bills, having little opposition to meet this session (1864). What opposition there was came chiefly from the Lancashire and Yorkshire Company, and was directed against the York and Doncaster line on the ground that it would divert traffic from the old route which, between Askern and Knottingley, belonged to them. To the Act sanctioning this line an agreement with the Great Northern Company was scheduled, giving them the same powers over the new line which they possessed over the line from Knottingley to York; the North Eastern Company taking running powers over the Great Northern line from Askern to Doncaster and from Doncaster to the junction with the South Yorkshire line. By the Methley Act of this session, the line authorised in 1863 between Methley and Ardsley Junction became vested in the West Yorkshire, Lancashire and Yorkshire, and North Eastern Companies, in equal proportions.

Two projects for lines in the North Eastern district of a more or less competitive character failed this session—the North Durham and the Scarborough, Whitby and Staithes Railways. The first was withdrawn at an early stage, the other was rejected in committee. The object of the North Durham Railway was to acquire compulsorily the land occupied by the Pontop and Jarrow Railway, and to construct a riverside line from the south end of Tyne Bridge at Gateshead to Tyne Dock, together with several short connecting-lines and branches. Immediately after the withdrawal of the scheme the North Eastern Company decided to carry out a part of it themselves by making a line from Pelaw to Tyne Dock. The promotion of the Scarborough, Whitby and Staithes scheme and the rumours of preparations for invading the North Yorkshire ironstone field had made it clear to the North Eastern Company that, while the Cleveland Railway remained independent, there would always be a danger of complications arising to weaken their position in the district. Their directors, therefore, opened negotiations with the Cleveland Board which resulted in a provisional agreement for the transfer of the Cleveland line to the North Eastern Company on the basis of a guaranteed dividend of $5\frac{1}{2}$ per cent. per annum, being secured to the Cleveland Company on a share capital of £203,700. It was also decided to apply for powers to make a line from the Saltburn branch to the Cleveland Railway, and from the latter to various points in the ironstone-field in the townships of Brotton, Liverton, Kilton, Skinningrove, and Lofthouse. The agreement with the Cleveland Company was the natural precursor of a like agreement with the West Hartlepool Harbour and Railway Company, who held a large part of the Cleveland share capital.

Nobody in the North of England doubted that the West Hartlepool Docks and Railway would ultimately fall into the hands of the North Eastern Company. Of course, until the credit of the West Hartlepool Company had been restored, and the full extent of their traffic resources ascertained, there could be no question of treating with the North Eastern Company. In April, 1864, Ralph Ward Jackson suggested, in a letter to the *Railway Times*,* that the time had come for amalgamation, and when, at the general meeting in August, the West Hartlepool Board, somewhat indiscreetly perhaps, let it be known that they would be satisfied with $4\frac{1}{2}$ per cent. on their share capital, the way was paved for the resumption of negotiations which had been interrupted by the untoward events of 1862. By the 14th of November, 1864, the two Companies had come to terms, the North Eastern agreeing to guarantee to the former debenture and bond holders of the West Hartlepool, a preferential dividend of 4 per cent. in perpetuity from the 1st of July, 1868, with intermediate dividends of $3\frac{1}{4}$, $3\frac{1}{2}$ and $3\frac{3}{4}$ per cent. from the 1st of July, 1865, and to guarantee to the ordinary shareholders dividends at like rates per cent., calculated on £76 19s. for each £100 of their stock. Both parties to the agreement had reason to congratulate themselves on their bargain, the old creditors of the West Hartlepool Company (who had only assented under the compulsion of circumstances to the conversion of their debentures into shares) because they obtained a guaranteed dividend of 4 per cent. in lieu of a dividend on variable profits, the North Eastern Company, because they obtained a property essential to the security of their position on the east coast. "West Hartlepool," as the Chairman of the Company admitted, "was a tempting bait." It was a point to make for and accordingly, more than once, on the part of more than one Company, there had been attempts to reach West Hartlepool.†

At this very time the scheme for a new trunk line from Leeds to the Tees, intended to connect the London and North Western with the West Hartlepool system independently of the North Eastern, had been matured and brought out under the name of the Leeds, North Yorkshire and Durham Railway. Unfortunately for the promoters of the scheme the lessees of the Rosedale Mines, from which a great part of the traffic was expected to come, had just united their interests with those of the lessee of the Ferryhill Ironworks—they were also transferring to the North Eastern Company a private line of railway in process of construction from East Rosedale to

* April 30th, 1864.

† *Darlington and Stockton Times*, February 18th, 1865.

Blakey Junction—the consequence being that the ironstone of the Rosedale Valley would necessarily go northward along the North Eastern Railway. But there were other ironstone valleys unserved by a railway. One of these was Bilsdale, up which the new line was intended to be carried, passing by a tunnel through Ingleby Bank by way of Stokesley and Stockton to Cowpen Bewley, there to join the West Hartlepool system. The length of the main line was $75\frac{1}{2}$ miles, of the branches from Helmsley to Pickering and Scarborough and from Kirbymoorside to Farndale $40\frac{1}{4}$ miles, and of the various short connecting lines—no fewer than 11 junctions being proposed with the North Eastern— $8\frac{3}{4}$ miles. Total, $124\frac{1}{2}$ miles. The estimated cost was £1,500,000.* Don Quixote and the Spanish windmills recurred to the mind of the North Eastern Chairman as he pictured the projectors of this line setting out to encounter the difficulties which attended the making of a railway in the environs of Leeds and through the Cleveland Hills.† It was considered necessary, however, to meet the attack by improving the service of trains on the Thirsk and Malton branch, and by filling up part of the district threatened with invasion by a line from Gilling to Helmsley, Kirbymoorside and Pickering.

A Scarborough and Whitby line, quite distinct from the Scarborough, Whitby and Staithes line of the previous year, was projected in 1865 with no other object than to improve the communication between the two towns; but the North Eastern Company held aloof from this scheme, considering that the making of the direct line was not a matter of pressing necessity. They deposited plans, however, for a short line to connect the Rillington and Pickering and York and Scarborough branches which reduced the distance by the existing route—56 miles—by 10 miles.

Another East Yorkshire project which threatened to come into competition with existing lines was for a line from Hornsea, through the great Wold valley to Malton. Owing to the opposition of Sir George Strickland, the principal landowner, the scheme was curtailed to a short line from the Hull and Bridlington branch at Lowthorpe to Wold Newton, a distance of 10 miles, passing Harpham, Kilham, Rudston and North Burton, but it appears to have met with little support.

Since the collapse of the Liverpool, Manchester and Newcastle Junction and Northern Counties Union schemes, many an adventurous glance had been cast across the wide tract of pastoral and agricultural country lying west of

* *Railway Times*, December 17th, 1864, and May 13th, 1865.

† *Darlington and Stockton Times*, February 18th, 1865.

the Leeds Northern line—1,200 square miles in area—still unpenetrated by a railway. Now from three different points on the Little North Western Railway, three lines, projected with the object of admitting the Midland, Lancashire and Yorkshire and London and North Western Companies into North Eastern territory, were converging upon Leyburn, the westernmost outpost of the North Eastern Railway. The most dangerous of these lines was the North of England Union, 88 miles in length, which, leaving its base at Settle, proceeded up Ribblesdale to Hawes, Askrigg and Leyburn, and thence by way of Richmond and Darlington to Carlton, where it fell into the West Hartlepool system. Another was the East and West Yorkshire Union, about 60 miles in length, running from Sedbergh, through Garsdale and Wensleydale to Leyburn, and thence by way of Middleham and Masham to Melmerby Junction, with a branch from Hawes up Widdale and down Ribblesdale to Settle; the third was the Skipton, Wharfedale and Leyburn Junction, 31 miles in length, which, commencing at a point near Gargrave Station on the Midland (Little North Western) line proceeded in a northerly direction by way of Kettlewell to a point near Spennithorne station on the Bedale and Leyburn branch of the North Eastern Railway. The original intention of the promoters of the East and West Yorkshire Union line had been to carry the line from Hawes northward to join the Eden Valley Railway at Kirkby Stephen, but the North Eastern Company looking askance at this extension as likely to compete in some measure with their Barnard Castle and Tebay line, the promoters resolved upon joining the London and North Western Railway.

Among the minor schemes of the year were two short lines for the accommodation of the lead-mining valleys of Allendale and Teesdale, one of them a branch from the Newcastle and Carlisle Railway to Allendale Town and Allenheads, the other a branch from the South Durham and Lancashire Union line to Middleton-in-Teesdale, but frankly stated by the promoters to be merely an instalment of a proposed extension from Barnard Castle to Alston. To the capital of the Hexham and Allendale Company the North Eastern Company were subscribers to the amount of £10,000, to that of the Tees Valley Company to the amount of £25,000. The Forcett Railway, a short mineral line from Gainford, on the Darlington and Barnard Castle branch, which is worked, though not owned, by the North Eastern Company, was authorised this year.

The problem of extending the old Leeds and Selby Railway from its Leeds terminus in Marsh Lane to the centre of the town had been solved by substituting, for a line running across York Street, Kirkgate, Briggate,

Albion Street and Park Row to the proposed site of a new joint station on the north side of Wellington Street, a line commencing at the same point and running between York Street and Off Street, across Duke Street and St. Peter's burial ground—the line being carried on an embankment in order to avoid disturbing the graves—across the lower part of Kirkgate and over Briggate to a more suitable site for a station adjoining the Wellington Street station of the Midland Railway, south of Mill-hill.

In furtherance of their policy of improving the East Coast Route, the North Eastern Company were now applying for powers to complete the connection between the authorised Team Valley line and the main line north of Ferry-hill. They were also watching very closely the issue of a struggle between the Caledonian and North British Companies for the North of Scotland traffic in which, as one of the partners in the East Coast Route, they were greatly interested. The North British Company who, in 1862, had acquired the Edinburgh, Perth and Dundee Railway and in 1863 had obtained power to make, in connection with a branch of the Edinburgh and Glasgow Railway from Ratho to South Queensferry, a line from North Queensferry to Dunfermline, were now seeking powers to absorb the Edinburgh and Glasgow Railway and to bridge the estuaries of the Forth and Tay. In direct antagonism to the North British measures was a bill for the amalgamation of the Caledonian and Scottish Central Companies. Plans for a bridge across the Firth of Forth had already been before Parliament in connection with the Forth Bridge Railway project for linking the Edinburgh and Glasgow Railway near Pardovan with the North British Railway at Charleston and with the Glasgow and North British scheme—a rival line to the Edinburgh and Glasgow—of 1863-4. On the withdrawal of the first and the rejection of the second of these schemes the Edinburgh and Glasgow and North British Companies had deposited plans, prepared by Mr. Thomas Bouch, for a lattice girder bridge, $2\frac{1}{2}$ miles in length, crossing the navigable part of the Forth by four spans of 500 feet each at a height of 125 feet above high water of spring tides.

The Parliamentary fight between the North British and the Caledonian Companies was happily averted by mutual concessions. Under the "Scotch Territorial Agreement" of the 12th of May, 1865, the former Company withdrew their opposition to the North British measure and the North British Company assented to the amalgamation of the Caledonian and Scottish Central Companies. It was claimed for the North British Company that, in resisting the attempts of the Caledonian Company to monopolise the Glasgow traffic and to secure the bulk of the North of Scotland traffic, they had stood

forth as the champion of East Coast interests.* That the North Eastern and Great Northern Companies were not more profuse in acknowledgments of these services may be explained by the fact that since the opening of the "Waverley Route" in July, 1862, their traffic from Edinburgh to London had dropped from 4,045 tons in 1861 to 624 tons in 1863.† At this time the septuple agreement of 1856 for the division of the English and Scotch traffic between the Companies owning the east and west routes was the subject of a Chancery suit instituted by the Midland Company in concert with the North British Company, in which the latter Company occupied the peculiar position of being a co-defendant on one side and a sub-plaintiff on the other. In these circumstances the North Eastern and Great Northern Companies considered it necessary to propose a number of protective clauses of an unusually stringent character, giving them facilities and running powers over the North British and Scottish Central lines to Glasgow and Perth. These, though strenuously resisted, were ultimately sanctioned—with modifications—and incorporated in the Caledonian and North British Bills.

In their opposition to other measures affecting their interests, the North Eastern Company were equally successful. They procured the rejection of the Leeds, North Yorkshire and Durham Bill on the ground of the insufficiency of the estimates; they compelled the promoters of the Skipton, Wharfedale and Leyburn Junction scheme to abandon the Grassington and Spennithorne portion of their line and to limit the scope of their Bill to a line about 8 miles in length from Gargrave to Grassington; and they warded off the double attack on Wensleydale by an arrangement with the Midland Company. On the understanding that the Midland Company, who were pushing northward to Carlisle, would apply for powers in the ensuing session of Parliament to make a line from Settle to Hawes the promoters of the North of England Union Railway withdrew their Bill. The promoters of the East and West Yorkshire Union Railway at the same time gave up to the North Eastern Company the greater part of their scheme which was sanctioned under the title of the Hawes and Melmerby Railway, the arrangement being that the North Eastern Company should provide half of the share capital, viz., £175,000. The following lines, which now form part of the North Eastern system, were sanctioned, viz. :—

* North British Chairman's speech, Aug. 16th, 1865. *Railway Times*, August 19th, 1865.

† Evidence of Captain O'Brien on North British and Edinburgh and Glasgow Amalgamation Bill, *Railway Times*, June 17th, 1865.

Name of Railway.	ACT.		Length of Line.	Capital Intended to be Raised in Shares and by Loans.
	Description.	Date of Royal Assent.		
Hexham and Allendale*	28 Vic. cap. 87	19th June, 1865	Miles. (1) 13	£ 100,000
Tees Valley †	28 Vic. cap. 91	19th June, 1865	(2) 7	60,000
			7	66,000
			27	226,000

With the exception of the Gilling and Pickering branch—opposed by Lord Feversham and other supporters of the original Ryedale Railway—all the lines and works for which bills had been lodged by the North Eastern Company were authorised. The bill for the amalgamation of the West Hartlepool and Cleveland Companies with the North Eastern Company met with considerable opposition from the public bodies of Hull, who complained of the principle of equal treatment as applied to the ports of the North East coast by the North Eastern Company, alleging that Hull was by this means deprived of the advantage of its geographical position. They demanded not only that the North Eastern Company should charge a uniform mileage rate from all the North Eastern ports to the Lancashire manufacturing district, but also that the dues and other charges levied on the shipping at West Hartlepool should not be less than those levied on the shipping at Hull. Clauses were tendered embodying these demands, but they were rejected, and in the last week of the session, the Amalgamation Bill passed, and the troubled career of the West Hartlepool Company came to an end, the Cleveland Railway, and the West Hartlepool Docks and Railway, with five collieries still remaining unsold in the Coxhoe district, passing into the hands of the North Eastern Company on the 1st of July, 1865. Mr. Isaac Lowthian Bell (afterwards Sir Lowthian Bell), who had joined the Board of the reconstituted West Hartlepool Company in 1863, and taken an active part in the negotiations which paved the way for amalgamation, was transferred to the North Eastern Board.

* Directors appointed by the Act: Wentworth Blackett Beaumont, Joseph Dinning, George Lee, Thomas Sopwith. Appointed by the North Eastern Railway Company: William Rutherford Hunter. Appointed by the Commissioners of Greenwich Hospital: Charles Grey Grey. First chairman: Wentworth Blackett Beaumont.

† Directors appointed by the Act: George Brown, John Dixon, Thomas Macnay, Henry Pease, Henry Fell Pease, Thompson Richardson, William Thomas Scarth, Robert Thompson, Rev. Thomas Witham. First chairman: Rev. Thomas Witham.

After every attack the North Eastern Company had gained strength. Amalgamation had followed amalgamation, and the number of defensive lines had been increased until the North Eastern Company occupied a position of security unequalled in the country. Several of those defensive lines were opened this year (1865)—the Otley branch ($3\frac{3}{4}$ miles) on the 1st of February, and the joint line from Otley to Ilkley ($6\frac{1}{4}$ miles) on the 1st of August, the Methley joint line ($4\frac{1}{2}$ miles) in August, the Market Weighton and Beverley branch (11 miles) on the 1st of May, the Whitby deviation line ($4\frac{1}{2}$ miles) and the Rillington curve ($\frac{1}{2}$ mile) on the 1st of July, on which date express trains began running direct between Scarborough and Whitby in an hour and a half. The opening of the East Rosedale mineral line ($4\frac{3}{4}$ miles) on the 18th of August, added another valuable feeder to the system, and the opening of the line between Castleton and Grosmont ($7\frac{1}{2}$ miles) on the 2nd of October completed the direct line of communication between Scarborough and Whitby and the other North East ports. By the Bishopwearmouth (Pallion and Deptford) branches ($1\frac{1}{4}$ miles), opened on the 1st of October, a connection was formed with shipping places on the Wear. Portions of the Cleveland Railway between Boosbeck Lane and Loftus Bank were opened in February and April, 1865, but a small portion of the railway, including the Kilton Viaduct, was still uncompleted when it came into the hands of the North Eastern Company. The three lines which combined to form the North Eastern Railway had now expanded into a system of over 1,200 miles.



SEAL OF WEST HARTLEPOOL HARBOUR AND RAILWAY COMPANY.

CHAPTER XVIII.

FAVOURABLE RESULTS OF AMALGAMATION.

[1865-1872.]

The effect of the various schemes of invasion had been to precipitate events which might otherwise have remained, as it were, in the clouds. But for these schemes, many years would probably have elapsed before the lines which had maintained their independence up to this period were merged in the North Eastern system, and before the rich mineral districts of Durham and North Yorkshire were closed against intruders by a cordon of defensive lines. The success which had attended the efforts of the North Eastern Company to preserve the integrity of their district was attributed by the chairman, Mr. H. S. Thompson, to the liberal policy pursued. "The directors," he said, "had framed their policy upon this assumption—that they held the district so long, and so long only, as the majority of thinking men in the district believed that they were as well served by the North Eastern as they could be served by other companies."* In pursuance of this policy they had made a number of substantial concessions to the public. On the 1st of January, 1860, return tickets at a reduced rate for first and second class passengers had been extended from a portion of the system to the whole of it, except on the Sunderland and Tynemouth branches where the fares were low. On the 1st of January, 1861, the extra charge made for the quicker service of express trains had been discontinued, the privilege of travelling by express trains had been granted to second class passengers and the second class carriages generally provided with cushions. On the 1st of July, 1864, the first class fares had been reduced on the seaside lines from 3d. to 2½d. per mile; on the 1st of July, 1865, the first of a series of reductions in the fares over the whole system had taken place, the arrangement being to lower the fares gradually during a period of three years from 3d. to 2d. per mile first class; from 2d. to 1½d. per mile second class; to abolish the old third class fare of 1½d. per mile; and to carry all third class passengers at the government fare of 1d. per mile. Between 1860 and 1865

* Speech at half-yearly meeting, February 20th, 1866. *The Railway Times*. 1866, p. 215.

reductions, varying from 10 per cent. to 20 per cent., had been made in the rates on coals for shipment. The goods rates also had been lowered. Reduced rates and fares, increased accommodation, improved services of trains, the outlay of money on new works for the development of trade—these were the beneficial results of amalgamation and of the concentration of power in the hands of a great and progressive company.

Though the temptation to reach Hartlepool had been removed by the North Eastern and West Hartlepool amalgamation, the attempts to force competing lines into the heart of the North Eastern system were by no means abandoned. The projectors of the Leeds, North Yorkshire and Durham Railway having improved their scheme by alterations in the terminal arrangements at Leeds, Scarborough, Hartlepool and Middlesbrough it was again brought forward, a more formidable rival than ever to North Eastern interests by reason of a proposed alliance with a new Durham coast scheme—the Tyne, Wear and Tees—the nucleus of which was the little Londonderry, Seaham and Sunderland line. By means of these two railways the great companies stationed at Leeds could reach the Tyne and, crossing that river, form a junction with the Blyth and Tyne Railway which, in its turn, gave them access to the North British system. To these great schemes was now added a third, of equally dangerous character—the Hull, Lancashire and Midland Counties Railway, the object of which was to bring the Great Eastern and Great Northern Companies north of the Humber. An arrangement had just been concluded between these two Companies by which the Great Eastern, desirous of access to the South Yorkshire coal-field, were to become joint owners, with the Great Northern, of the loop line from Spalding to Gainsborough and of the connecting-lines, then being constructed, between March and Spalding, and Gainsborough and Doncaster. Now, from this joint line near Bardney it was proposed to make a line to Snelland and to take running powers over the Market Rasen branch of the Manchester, Sheffield and Lincolnshire Railway to Howsham. From Howsham the invading line, as laid down by its projectors, proceeded northward to Barton, being joined in its course by auxiliary lines from Brigg and Frodingham. It crossed the Humber by a lofty viaduct, about a mile and a half in length, and, touching solid ground again at Hessle, ran parallel with the Hull and Selby line to Hull, shortening the distance between Hull and London by 14 miles and between Hull and Manchester by 28 miles. From Hessle other parties proposed to continue the line northward by way of Market Weighton, Wharram and the

vale of Rillington to the Leeds, North Yorkshire and Durham line near Wykeham, and to connect it with Bridlington by means of a branch through the great Wold valley. The proposal to bring the Great Eastern, the Great Northern, the Midland and the Manchester, Sheffield and Lincolnshire Companies into Hull met with the unanimous approval of the chief public bodies of the town. Why they were opposed to the North Eastern Railway Company is not quite clear. The rates, as Mr. J. A. Wade pointed out to a meeting held in Hull on the 22nd of July, 1865, were, to a certain extent, compromises with neighbouring railway companies and were eminently in favour of Hull.* The North Eastern Company could certainly not be charged with indifference to the interests of the port. They had just taken powers in their Pelaw and Other Branches Act to subscribe £50,000 towards the cost of construction of a dock on the west foreshore of the Humber—the present Albert Dock, without stipulating for any exclusive or even any preferential advantage. There was a possibility at this time that the Railway Company might still further increase their stake in Hull by uniting the docks to their system. In October, 1865, a conference took place between the directors and officers of the North Eastern Company and deputations from the Hull Corporation, the Hull Chamber of Commerce, the Hull steamship owners and the Hull Dock Company for the purpose of considering subjects mutually interesting to the Railway Company and the Town and Port of Hull, when the question of the transfer of the Hull Docks to the Railway Company was freely discussed.† The steamship owners of Hull were almost to a man in favour of the transfer,‡ but the Hull Corporation, in spite of dissensions with the Dock Company, were not prepared to allow the docks to fall into the hands of the Railway Company without a struggle. They called a public meeting to consider the question of vesting the docks in a body of trustees for the benefit of the borough, and, on the 23rd of December, 1865, deposited a Bill for the establishment of this Dock Trust.§ It was probably on account of the opposition with which they were threatened that the Railway Company decided to abandon their design of acquiring the docks.||

* *Railway News*, July 29th, 1865.

† *The Engineer*, October 6th, 1865.

‡ *Railway News*, October 31st, 1865.

§ Owing to the opposition of a number of the ratepayers, who dreaded a borough rate, together with the opposition of the Hull Dock Company and the North Eastern Company, this Dock Trust Bill was thrown out by a Committee of the House of Commons in the following spring. Sheahan's *History of Kingston-upon-Hull*, 2nd ed., 1866, p. 767.

|| *Railway News*, October 31st, 1865.

The three schemes of invasion which looked so formidable in the autumn of 1865 had assumed a very inoffensive character by the end of the year. With regard to the first—the Leeds, North Yorkshire and Durham—the North Eastern Company bought out the more influential of the promoters, paying the expenses incurred and undertaking to supply the district by degrees with railways.* In accordance with this arrangement they lost no time in giving notice for a series of lines intended to form, in conjunction with the Leeds Northern line, a new through route to Scarborough without going to York at all, viz., a line from Leeds to Wetherby, representing the first section of the Leeds, North Yorkshire and Durham scheme, a line from Knaresborough to Boroughbridge, which, though sanctioned by Parliament in 1847, had not been made, and connecting lines between the Boroughbridge and Thirsk and Malton branches at Pilmoor, and between the Thirsk and Malton and York and Scarborough branches at Malton. They also gave notice again for the rejected Gilling, Helmsley and Pickering line of 1864 without the curve from Stonegrave to Hovingham. As to the “Tyne, Wear, and Tees” scheme, it went forward in conjunction with a “Middlesbrough, Stockton and Billingham” scheme, which included a swing bridge over the Tees, but it was now reduced to the status of a mere local line by the withdrawal of the “Leeds, North Yorkshire and Durham” scheme. It was probably owing to the projection of this line and to the competition of omnibuses between Sunderland and South Shields that the North Eastern Board decided to relay the old Harton branch which had been closed for 25 years, and convey passengers from one town to the other by way of Cleadon Lane, instead of Brockley Whins, thereby reducing the time of the journey from 45 to 15 minutes.†

Lastly, the Hull, Lancashire and Midland Counties scheme was withdrawn at the last moment owing to the lack of support. The promoters had counted on the assistance of all the companies whose lines approached Hull, but some of these were so closely allied with the North Eastern Company, as parties to the “Humber Agreement,” that they necessarily kept aloof. Another line was then brought out in opposition to the North Eastern Company called the Hull, West Yorkshire and Lancashire Railway, which created but little interest, being a mere duplicate of the Hull and Staddlethorpe line with running powers over the authorised Staddlethorpe and Thorne branch, and connections between this line and the Lancashire and Yorkshire Railway. Intense regret was expressed in Hull that the projectors of the great Humber

* *Railway News*, November 18th, 1865.

† *Ibid.*, October 7th, 1865.

Bridge did not bring forward their scheme, especially when, a week later, notice was given of a proposed amalgamation of the Great Eastern and Manchester, Sheffield and Lincolnshire Companies, followed up by the announcement of a larger combination, that of the Great Eastern, Great Northern and Manchester, Sheffield and Lincolnshire Companies.

With so much hostile feeling against them in Hull, the North Eastern Company could not fail to welcome an opportunity which presented itself at this time of annexing to their system the only independent line in the district—the Hull and Hornsea Railway. The actual cost of this railway had been about 75 per cent. more than the estimated cost, and the Hull and Hornsea Company were burdened with a heavy load of liabilities. They had tried to raise money by the issue of preference stock at 5 per cent., but without success. In these circumstances, the only course open to them was to ask the North Eastern Company to take over the line. Negotiations ensued, and it was arranged that the Hull and Hornsea line should be transferred to the North Eastern Company upon the following terms, viz., that the latter should keep a separate account of the revenue derived from it and, after paying working expenses and interest on debts and liabilities, hand over any balance remaining on this account to the Hornsea shareholders, reserving to themselves the power of exchanging at any time 4 per cent. guaranteed stock for the Hull and Hornsea shares. Notices of a Bill to confirm the agreement were then prepared, but before the Bill could be introduced some creditors distrained upon the Hull and Hornsea Company, and the furniture, fittings, telegraph instruments and other effects at the stations were sold by auction on the 4th of January, 1866. With very few exceptions, the effects sold came into the hands of one purchaser acting on behalf of the Hornsea Company, and, on the 16th of July following, the Royal assent was given to the Act authorising the transfer of the railway to the North Eastern Company.

The North Eastern Company had now to face the prospect of a Midland extension from Settle to Carlisle and the probable alliance of the Midland and North British Companies. A few months earlier, the Midland Company had all but come to an arrangement with the London and North Western Company for the use, jointly with themselves, of the Lancaster and Carlisle Railway between Ingleton and Carlisle, when the negotiations broke down on the question of the Midland rates to Carlisle which the London and North Western Company claimed should be fixed by agreement or submitted to arbitration.* Already pledged to make that portion of the North of England Union Rail-

* *The Railway Times*, May 18th, 1867.

way between Settle and Hawes, the Midland Company had deposited plans for a line which would not only serve this district, but would enable them to reach Carlisle independently of the London and North Western Company and effect their purpose of joining hands with the North British Company. In view of such a contingency the North Eastern Company prepared a survey of an extension from the Kelso branch at Coldstream through Greenlaw and Lauder to Edinburgh.* The London and North Western Company fought hard to procure the rejection of the Midland scheme, but, in spite of their opposition, the Bill for the Settle and Carlisle extension was passed and became law on the 16th of July, 1866. A line to connect the North British system at Longtown with Brampton was sanctioned soon afterwards. It had the support of the North British Company and probably formed part of a larger scheme, but the powers conferred by the Brampton and Longtown Act were never exercised.

The withdrawal of the Tees, Wear and Tees, Middlesbrough, Stockton and Billingham, and Hull, West Yorkshire and Lancashire schemes relieved the North Eastern Company of any further anxiety with regard to the security of their district. During the session of 1866 they carried all their measures, obtaining power to make the series of lines (see p. 624) which ensured them against any resuscitation of the Leeds, North Yorkshire and Durham scheme, also power to make loop lines in Durham and North Yorkshire and to construct a larger station at York outside the City walls.

An important amalgamation which affected the interests of the North Eastern as well as the other East Coast Companies was sanctioned this session—that of the Caledonian and Scottish North Eastern Companies. The East Coast Companies, who had vigorously opposed the measure, secured the insertion of clauses in the Act, which conferred upon them unusually stringent running powers from Edinburgh and Glasgow to Perth and Aberdeen. “These clauses,” said Mr. H. S. Thompson, “gave not only the power of running and the power of placing our servants at the stations, but they gave a certain amount of control over the rates, because, although the Act fixed the minimum rate, that minimum was below the rate charged; therefore they gave us considerable power of competition by rates as well as competition by running.”†

Two companies were incorporated this session for the purpose of making lines in the North Eastern Company’s district, one from the Darlington and Barnard Castle line to Melsonby, the other from Whitby to Loftus, viz.:—

* *Railway News*, October 14th, 1865.

† *Evidence on Railway Companies Amalgamations*, 1872, p. 505.

Name of Railway.	ACT.		Length of Line.	Capital Intended to be raised in Shares or by Loans.
	Description.	Date of Royal Assent.		
Merrybent and Darlington *	29 Vic. cap. 75	11th June, 1866 †	Miles. 6 $\frac{3}{4}$	£ 80,000
Whitby, Redcar and Middlesbrough Union †	29 & 30 Vic. cap. 195	16th July, 1866	15 $\frac{3}{4}$	333,300
			22 $\frac{1}{2}$	413,300

The question of the transfer of the West Durham Railway to the North Eastern Company had been raised during the half year. The directors of the West Durham Company, finding that changes in the working of the West Hartlepool and Stockton and Darlington sections were affecting their traffic, had opened negotiations with the North Eastern Board and secured favourable terms of arrangement; these terms were that the North Eastern Company, who already held £29,370 of the West Durham capital, should purchase the remaining shares amounting to £16,520, at the rate of £110 per cent., paying interest at the rate of £5 10s. per cent. on those shares from the 1st of July, 1866, until the completion of the transfer. Every line between the Humber and the Tyne, authorised previously to 1865, was now in the hands of the North Eastern Company, and not a band of raiders remained in the district. It was with no ordinary satisfaction that Captain O'Brien, and those who with him had organised the defence of the North Eastern Railway during the most perilous period of its existence, could contemplate the results of their work. Not a position of importance had been surrendered, not an inch of territory lost. Steadily the net revenue had increased, until, in 1865, the dividends on the various sections of ordinary stocks reached the following points:—

				1865.	1854.
				£ s. d.	£ s. d.
York, Newcastle and Berwick	...	...	...	6 0 0	3 17 6
York and North Midland	...	...	...	5 12 6	2 10 0
Leeds Northern	...	...	...	3 13 9	nil
Newcastle and Carlisle	...	...	...	8 0 0	5 0 0
Stockton and Darlington	...	...	...	8 15 0	8 5 0

* Directors appointed by the Act: Robert Henry Allan, Joseph Boyer, Christopher Lonsdale Bradley, Lonsdale Bradley, Henry Currer Briggs, John Harrison, William Henry Wilson Todd. First chairman: Robert Henry Allan.

† Directors appointed by the Act: John Henry Dillon, The Marquis of Normanby, Charles Mark Palmer, who elected, under the Act, William Laurence Banks. First chairman: The Marquis of Normanby.

One great work of amalgamation had yet to be accomplished—the consolidation of the various stocks, and that work was already occupying the attention of the Board.

Hardly had the North Eastern Company settled down to the enjoyment of a state of immunity from attack than they had to face a series of internal troubles. A strike in the iron trade and a financial crisis in the country produced a commercial depression in the North of England which seriously affected the receipts of the North Eastern Company. It became necessary to



KILTON VIADUCT, NEAR LOFTUS.

reduce expenses. A number of men were discharged. The train service was reduced, where practicable. The express trains on the Malton and Thirsk line, which had been run since the projection of the competing Leeds, North Yorkshire and Durham line, were withdrawn altogether. The running of trains between Whitby and Scarborough direct was also discontinued, and all traffic between these places worked *via* Malton as before. The Rillington curve, which had been formed so recently as July, 1865, was closed on the 1st of October, 1866, the points being pulled up and the signalman removed.* 1866 was one of the few years in which no increase was shown in the North

* *Railway Record*, October 6th, 1866.

Eastern mileage, and no application was made to Parliament for powers to undertake new works. Two works, however, were practically completed by the end of the year—the re-laying of the Harton branch (re-opened for traffic on the 1st of January, 1867), and the construction of a section of the Cleveland Railway ($1\frac{1}{4}$ miles), including the Kilton Viaduct, unfinished at the time of the Cleveland and North Eastern amalgamation in 1865. By the completion of this viaduct, which was brought into use in the early part of 1867, a picturesque addition was made to the engineering features of the North Eastern Railway. The viaduct, which was built upon a curve of 18 chains radius from the designs of Mr. (afterwards Sir James) Brunlees, was 226 yards in length and consisted of a superstructure of wrought-iron lattice girders, with twelve spans of 45 feet and one skew span of 52 feet, supported on twelve piers of freestone at a height of 150 feet above the bed of the Kilton beck.*

The year 1866 had been marked by considerable unrest in the labour world. In the latter part of the year the engine drivers and firemen throughout the country started an agitation for higher wages and improved conditions of service. Their demands had reference to points so various as:—Hours of labour, overtime, wages, promotion, superannuation and right of appeal in case of punishment. The North Eastern and London Brighton and South Coast men were the first to take action. The former waited upon the directors in January, 1867, and presented two memorials—one dealing with the hours of labour and wages question and the other with local conditions. The general demands were that 10 hours, or a run of 150 miles for passenger men and 120 miles for goods and mineral men, should be reckoned as a day's work, overtime being calculated at the rate of eight hours to the day, or 120 miles for passenger and 100 miles for goods and mineral men; that Sunday duty should be counted as time and a half, and paid for at the same rate of mileage and hours as on week-days; that wages should be paid on the following scale: drivers, 6s. per day for the first six months, 6s. 6d. for the next six months, and 7s. at the end of twelve months; firemen, 3s. 6d. per day for the first twelve months, 4s. at the end of twelve months, and 4s. 6d. after three years' service; that the cleaning of the engine by the drivers and firemen, as was then the custom, should be abolished, and one "shed day" allowed in the

* At the present time (1913) the viaduct is enclosed in a huge embankment of mine-refuse, the ironstone workings in the district having threatened the foundations. For further particulars of this viaduct see *North Eastern Railway Magazine*, April, 1911, pp. 86-88, and June, 1912, p. 142.

week; that the firemen should be promoted to the situation of drivers according to seniority and length of service, etc. As the directors were at first indisposed to consider the memorials, the men handed in their notices. A conference was afterwards arranged between the men and the managers and the notices were withdrawn. The limitation of the day's work to 10 hours—the primary object of the agitation—was conceded, but the men at Darlington were under the impression that Mr. Fletcher, the locomotive superintendent, had also agreed to let them have one “shed day” a week, and on finding that this arrangement was not to come into force, instead of appealing to Mr. Fletcher, as the agreement provided, they struck work on the 10th of April without giving the proper notice, alleging a breach of faith on the part of the railway authorities as the cause of their action. This attempt of the engine drivers and firemen to throw the whole railway system of the North of England into confusion was frustrated by the energy of the Company's officers. Promptly engaging a number of men familiar with the working of locomotive engines and arranging that some member of the staff who knew the line should accompany a new driver on the footplate, they issued a provisional time-table, and managed to provide a fairly adequate service of trains. In a few days there were more applicants for the vacant situations than the managers could employ and the places of the men on strike were rapidly filled up. Several of the disaffected engine-men—those who had been the first to strike—were prosecuted for breach of contract, but, on pleading guilty, they were discharged with the forfeiture of the wages due to them. Only a few of the old hands were taken back. Many of the others, with the aid of the Trade Unions, emigrated to America. For some weeks the working arrangements of the Company were somewhat upset, especially in the goods and mineral departments, but, by the beginning of May, most of the trains withdrawn during the strike had been restored, both on the main line and on the branches, and later on in the month the Company were able, not only to run the usual special trains to the York Races, but partially, at least, to open the excursion season by running trips to Whitby, Castle Howard and other places.

In the autumn of 1867, a shareholder's criticism of the North Eastern accounts caused a considerable perturbation in the public mind, of which the “bears” of the Stock Exchange did not fail to take advantage, the result being that the market value of the Company's stock fell by no less than three quarters of a million. The shareholder was Mr. Henry J. Trotter of Bishop Auckland, a barrister by profession, who, finding that the amount

expended per mile by the Great Northern Company on the maintenance and renewal of permanent way during the half year ending June 30th, 1866, was very much greater than the amount shown under the same head of expenditure in the North Eastern accounts for the same period, jumped to the conclusion that, in the appropriation of North Eastern expenditure, revenue had been favoured at the expense of capital—in other words, that the Company were paying a larger dividend than they had fairly earned. Another discovery made by Mr. Trotter was that the last dividend of the Company had been paid out of borrowed money, and that, owing to the difficulty in obtaining the loan, it was uncertain a few hours beforehand whether or not a dividend could be paid at all. These discoveries were imparted to the world in a series of letters which, in the sensitive state of the public mind with regard to railway property, attracted more attention than they deserved. Mr. Trotter, as the chairman of the Company clearly showed, had fallen into error by comparing amounts which did not include the same items. While the Great Northern Company charged the cost of repairs and renewals against the revenue of the first six months of the year, the North Eastern Company charged only the cost of repairs, the cost of renewals for the *whole* year being debited against the revenue of the second half of the year. Even when the amounts expended annually by these Companies under the head of maintenance and renewal of permanent way were compared, the dissimilarity of circumstances had to be taken into account before any useful deduction could be drawn from the figures. The story of the loan that paid the dividend was “a pure fiction.” Though it had been pointed out to Mr. Trotter that his statements were founded on a misapprehension, he reaffirmed his belief that the working expenses of the North Eastern Railway, as shown in the accounts, were much below what he considered they ought to have been and the vigour with which he returned to the charge was, to say the least, disquieting. Up to this time the North Eastern Railway had stood deservedly high in the confidence of the public, and now the very grounds of that confidence—the integrity of the Board and the trustworthiness of the accounts—were called in question. The saying of one of the shareholders that when a man has kicked up a dust of figures people are ready to think there is something in it, aptly describes the situation. A special meeting of the Company called for the 19th of November to consider the question of abandoning the Leeds and Wetherby branch and of raising the limit of interest on debenture stock about to be issued from 4 to 4½ per cent., gave the directors an opportunity of meeting the charges brought against them by Mr. Trotter. Accordingly,

after the transaction of the formal business the chairman introduced the subject of Mr. Trotter's letters, and, in a fair and temperate manner, replied to his impeachment of the directors' policy and of their system of account-keeping, leaving to Mr. Harrison and Mr. Tennant the task of dealing with special points in the indictment relating to their respective departments. These gentlemen were followed by Mr. Glegg, of the firm of Quilter, Ball & Company, the Company's auditors, who stated that no railway accounts had come before them more efficiently and honestly made out than were those of the North Eastern Railway Company. The effect of this vindication of their management by the directors was to cause a return of quotations to their former standard, Berwicks rising rapidly from 91 and 92 to 97½.*

Mr. Trotter's criticism, though based on erroneous data, perhaps served a useful purpose, for it seems to have been followed by a careful review of the capital expenditure of the Company and to have led to the permanent enlargement of the half yearly report by the addition to the customary accounts of an abstract of the capital expenditure during the half-year as well as a statement of all further liabilities on capital account. At both the half-yearly meetings in 1867 the chairman had referred to the desirability of a change of policy in regard to extensions. The right policy he considered was to proceed steadily with those works on which money had already been spent with a view to bringing them speedily into a productive state, to postpone the construction of some of the other lines as long as possible, and to abandon the rest. The question of reducing the capital expenditure had been raised at the meeting of the 19th of November, and, shortly afterwards, the directors were in a position to come before the shareholders with certain definite recommendations regarding the various authorised works which had not as yet been commenced, viz., (1) Works proposed to be executed during the years 1868, 1869 and 1870 at an estimated cost of £374,500—the Pelaw branches, the Team Valley extension, the branch to connect the Saltburn and Cleveland lines, the curves at Pilmoor, Norton and Ayton, the alteration of roads at Stockton, the lines at Hartlepool and Ferryhill and the junction at Guisbrough. (2) Works proposed to be abandoned or postponed—the Leeds and Wetherby, Gilling and Pickering, Knaresborough and Boroughbridge branches, Pilmoor branch and doubling line from Pilmoor to Gilling, York new station and lines, and the Hawes and Melmerby Railway, representing a capital expenditure on the part of the Company of £1,011,000.

* *Railway Times*, November 23rd, 1867, p. 1,191.

The Derwent Valley or Blaydon and Consett branch, brought into use for mineral traffic on the 18th of June, 1867, had just been opened—on the 2nd of December, 1867—for passenger traffic. A single line, with the exception of one short section of 300 yards near Scotswood Bridge and another section of 2 miles between Rowlands Gill and Lintz Green, the branch followed a winding course through the beautifully wooded valley, rising for some distance on heavy gradients of 1 in 60 and 1 in 66. It was carried over the Derwent by a stone viaduct of nine arches and again by a brick and stone viaduct of seven arches, both 80 feet in height, over the Fogoes burn near Lintz Green by a brick and stone viaduct of six arches, 90 feet in height, and over the Pont burn by a brick and stone viaduct of ten arches, 120 feet in height. These viaducts, the arches of which were each 60 feet in span, and a cutting 60 feet deep near Rowlands Gill, formed the principal features of the line. On the 21st of December, two small junction lines at Bishop Auckland were opened. There remained uncompleted at the end of 1867 the Team Valley, the Church Fenton and Micklefield, and the Hull and Doncaster branches, together with the Leeds extension line and station.

The Hexham and Allendale Railway (of which Thomas J. Bewick was the engineer) had been opened from the Border Counties Junction, near Hexham, to Langley ($7\frac{3}{4}$ miles) for goods and mineral traffic on the 19th of August, 1867; on the 13th of January, 1868, it was opened as far as Catton Road, a further distance of $4\frac{1}{2}$ miles, for the same kinds of traffic. Owing to financial straits which prevented the Company from forming a permanent junction with the North Eastern Railway, building stations and incurring various incidental expenses, the opening of the line for passenger traffic was delayed until the 1st of March, 1869. Another independent line—the Tees Valley Railway ($7\frac{3}{4}$ miles), running like the Hexham and Allendale Railway through picturesque scenery, was formally opened on the 12th of May, 1868. The country through which the line ran was broken by the valleys of the Balder and the Lune, and over these the line passed by means of viaducts of stone and brick, the first—100 feet in height—consisting of nine arches of 30 feet span each, the second—60 feet in height—having five arches of 50 feet span each. In 1868 the Team Valley branch ($12\frac{1}{2}$ miles) was opened—on the 2nd of March for goods and minerals, and on the 1st of December for passengers. A feature of the line



From "The Illustrated London News," May 30, 1868, pp. 532-533.

LEEDS FROM HOLBECK JUNCTION (SHOWING NORTH EASTERN GOODS STATION ON LEFT).

was a viaduct near Chester-le-street, which consisted of eleven semi-elliptical brick arches of 60 feet span each, stone parapets, and brick piers with stone plinths. built on a curve of a mile radius over the Chester burn and the Pelton Fell road at a height above the latter of 90 feet. The Ayton branch, which had been worked in connection with the mineral traffic since 1864, was opened for passenger traffic on the 1st of April, 1868, and, on the 5th of June, a small loop connected with the Derwent Valley branch at Consett was brought into use.

In 1869 the following important openings took place in the southern part of the system—the Church Fenton and Micklefield branch (5 miles), the Leeds Extension line (1 mile), the Leeds New Station on the 1st of April, and the Hull and Doncaster branch on the 30th of July.

As works of engineering interest the viaducts and bridges over which the Leeds extension line was carried from Holbeck to Marsh Lane and the hydraulic swing bridge over the Ouse near Skelton, all designed by Mr. Thomas E. Harrison, claim more than a passing notice. The line through Leeds commenced by a junction with the Midland Railway about a hundred yards west of the Leeds and Liverpool canal, crossed the canal by a wrought-iron bridge of 127 feet span, passed over the site of the

old circular engine-shed of the Midland Railway Company, crossed the canal basin by a wrought-iron bridge of 85 feet span, passed through the new station which was erected on arches over the river Aire, and was then carried to Marsh Lane by a series of viaducts and bridges, except for a distance of about 90 yards through the burial ground of St. Peter's Church where an embankment had been constructed, instead of a viaduct, in order to avoid breaking the ground and interfering with the graves. The principal bridge in



Photo by

SWING BRIDGE OVER THE OUSE AT SKELTON, NEAR GOOLE.

J. H. Raney.

point of dimension was that over the Leeds and Liverpool canal, which is said to have cost £10,000. It was 200 feet in width, and consisted of eight wrought-iron girders, each 20 tons in weight.* The Leeds New Station, built from the designs of Mr. Thomas Prosser, of Newcastle, covered an area of seven acres and a half. In the construction of the arches on which it was raised, about eighteen million bricks are said to have been used.† Having practically no frontage, the station added nothing

* Mayhall's *Annals of Yorkshire*, vol. iii., pp. 246-250.

† *Herapath's Railway Journal*, March 27th, 1869.

to the architectural embellishment of Leeds. The roof of the station shed consisted of glazed spans of wrought-iron supported on metal columns. The height of the roof was nearly 60 feet, and the width of the greatest span no less than 92 feet. The platforms were arranged for the accommodation of a through line of rails and for two bays, each containing four lines of rails. The station was owned jointly by the London and North Western and the North Eastern Companies, the former using the western bay and platforms (630 feet in length) and the latter the eastern bay and platforms (940 feet in length).

The swing bridge, which carried the Hull and Doncaster line over the Ouse between Skelton and Hook near Goole* was, with one exception, the largest double-line railway bridge with movable spans in the world. It was 830 feet in length, and 31 feet in width from outside to outside, with a headway of 14 feet 6 inches from high water, and 30 feet 6 inches from low water, datum. It had seven spans, five of them fixed and two of them movable. The fixed spans, each 116 feet in width from centre to centre of the piers, were formed of wrought-iron plate girders supported on cast-iron columns filled with cement. The movable portion of the bridge, which was 250 feet in length, consisted of a centre box girder and two solid webbed side girders of hog-backed shape, connected by transverse girders, weighing altogether 670 tons. Supported on a great centre pillar composed of seven cast-iron columns, one of which contained the accumulator, this ponderous mass was, with ease and rapidity, swung round on a turntable, 30 feet in diameter, by means of hydraulic machinery. An arrangement of resting-blocks and locking-bolts was used at the ends of the movable spans for the purpose of obtaining an entirely solid roadway and securing the perfect continuity of the rails when these spans were in their normal position. Safety in the working of the lines over the bridge was ensured by self-acting signals regulated by the fixing-gear at the two ends of the swinging girders.† The time in which the bridge could be either opened or closed was about a minute.

Besides making a large outlay on new works, the North Eastern Company had expended £100,000 in the renewal of timber viaducts and bridges on various parts of their system. Embankments had been substituted for the viaducts at Knottingley and Sherburn in 1863-4; the viaducts over the

* The bridge was formally opened five months before the line by Mr. T. E. Harrison, who, with several other officers of the Company and the contractors, passed over it in a special train.

† Description of the Hydraulic Swing Bridge for the North Eastern Railway over the River Ouse, near Goole. By Sir William G. Armstrong. *Proc. of Inst. of Mech. Engineers*, 1869, pp. 123-125.

Derwent near Malton and Huttons Ambo had been replaced by permanent structures of stone and iron in 1867; the timber bridges over the Esk and in the vale of Goathland on the Whitby and Pickering line and the bridges over the South Tyne on the Newcastle and Carlisle line had been renewed in 1867-9. At this time the Company were engaged in rebuilding the Ripon and Scotswood viaducts, reconstructing in iron the arches of the Ouseburn viaduct and replacing the Cassop viaduct by an embankment.

With regard to the works held over (enumerated on page 632) the Company had not yet asked Parliament to release them from their statutory engagements. In their negotiations with the principal land-owners and inhabitants of the districts through which the lines in question were to pass they had met with no success whatever. Modifications of plans had been accepted in a few instances, but no assents had been obtained to the directors' project of abandonment and postponement, though accompanied by offers of improvement in the existing train accommodation and a diminution of charges. An extension of time was granted by Parliament to the North Eastern Company in 1869 for the completion of some of their works. The making of the Hawes and Melmerby Railway had been postponed until it was known whether the Midland Company would construct their line from Settle to Hawes. By the refusal of Parliament to confirm the agreement between the Midland and London and North Western Companies for the use of a portion of the Lancaster and Carlisle line, the Midland Company had no course open to them but to exercise the powers of their Settle and Carlisle Railway Act, and, in view of the Midland extension to Hawes, it became necessary for the Hawes and Melmerby Company to apply to have their powers renewed. The engineer of the North Eastern Railway was of opinion that a cheaper line could be made between Leyburn and Hawes than that already authorised, and as there seemed little likelihood of the people in the district subscribing the necessary funds for the construction of the line between Leyburn and Melmerby, it was proposed and agreed that the Hawes and Melmerby Company should relinquish their undertaking, leaving the North Eastern Company to make the amended line. The Midland Company were to have power to run to Leyburn, and the North Eastern Company, on their side, to run to Settle.

At the very time when they were endeavouring to limit their capital expenditure, the remarkable expansion of the Cleveland iron trade compelled the shareholders to sanction an outlay of £100,000 for the enlargement of Middlesbrough Dock, which no longer met the requirements of the traffic. The dock gates, only 30 feet wide, would not admit the larger class of

vessels, and manufacturers had been obliged to send their iron to Hartlepool and Hull for shipment at an extra cost of from 3s. to 11s. per ton. In an Act of this Session (1869) authorising a railway between Richmond and Reeth, powers were taken to enable the North Eastern Company to work the railway when made, but the amount of local support given to the scheme fell so far short of the expectations of the promoters that it was not deemed prudent to begin the works.*

In 1869 the North Eastern Company began running the East Coast trains to and from Edinburgh. The reasons which led them to exercise powers which had lain dormant since 1862 may be found in the relations subsisting at this time between their Scottish partner and one of the competing West Coast Companies. In January, 1868, the North British Company had entered into a "joint purse" agreement with the Caledonian Company which restrained them from exercising the running powers secured for them over the Scottish North Eastern line under the Scotch Amalgamation Act of 1866. In these circumstances, the North Eastern and Great Northern Companies could not rely upon getting their due proportion of the English and Scotch traffic, especially as the much-contested Octuple Agreement was on the point of expiring, and they therefore decided to take measures for the protection of their own interests. The North Eastern engines travelled beyond Berwick with passenger trains on the 1st of June, 1869. On the 30th of the month the English and Scotch Traffic Agreement came to an end. The North Eastern and London and North Western Companies considered that the Agreement had answered its purpose and were both in favour of renewing it, but, owing to the difficulty of estimating the exact position of the Midland Company when established at Carlisle, the negotiations for a second pooling arrangement fell through.† To prevent undue competition, it was agreed among the companies interested in the through traffic that the same rates and fares should be charged by both east and west routes. No restriction was placed on the number of trains or the extent of the accommodation which might be provided by the owners of either route. Of this circumstance, the Great Northern and North Eastern Companies, acting independently of the North British Company, took advantage. They announced that a new express train would be started on the 2nd of August, 1869, leaving London at 8 p.m. and arriving at Edinburgh at 6.5 a.m., the

* *Darlington and Stockton Times*, February 26th, 1870.

† H. S. Thompson, May 13th, 1872, and W. Cawkwell, June 20, 1872. *Minutes of Evidence on Railway Companies Amalgamations*, Questions 5713-4 and 6815.

time allowed for the journey being half-an-hour less than that taken by the limited mail of the West Coast. It was timed to run in connection with the early morning trains from Edinburgh, due in Glasgow at 7.45 a.m., Perth at 8.59 a.m., Aberdeen at 12.20 p.m., and Inverness at 2.45 p.m. The "up" service of trains was also increased by another fast train, performing the journey between Edinburgh and London in 11½ hours.* By the Scotch Amalgamation Acts of 1865 and 1866, the North British and Caledonian Companies were bound to run a train without change of carriages, at a rate of 35 miles an hour over their respective portions of the route between Edinburgh and Aberdeen in conjunction with every train which should be run or appointed to be run by the East Coast from London or York to the North by way of Edinburgh, and *vice versa*, so that the enterprise of the two English Companies was the cause, incidentally, of enterprise in others. The London and North Western Company, in emulation, proceeded to run a new express train, leaving London at 8 p.m. and arriving at Glasgow at 7.10 a.m., twelve minutes before the limited mail. Passengers for Edinburgh by this express train joined the limited mail at Carstairs.† In the meantime the discovery by the North British Company that the Caledonian and London and North Western Companies had bound themselves by a secret agreement to work into each other's hands had led to a rupture of the "joint-purse agreement." In consequence of the competition which ensued, the North British Company revived the project of a bridge over the estuary of the Tay. Though the Great Northern and North Eastern Companies had no longer cause for anxiety on account of the West Coast leanings of the North British Company, they had still to watch very closely that Company's relations with the Midland Company. Owing chiefly to the opposition of the North British and Lancashire and Yorkshire Companies, Parliament had rejected the bill to authorise the abandonment of the Settle and Carlisle line and to sanction the use by the Midland Company of the Lancaster and Carlisle line. In anticipation of the competition of the central route the Midland, North British and Glasgow and South Western Companies concluded an agreement for the reciprocal interchange and development of traffic between the systems of the three Companies. The Great Northern and North Eastern Companies had acted wisely in looking after their own interests.‡ On the 1st of November, they began collecting and delivering goods and parcels in Glasgow with their own horses and rolleys.§

* *The Railway Times*, July 24th and August 7th, 1869.

† *Ibid.*, August 7th, 1869.

‡ *The Engineer*, September 24th, 1869.

§ *The Railway Times*, November 6th, 1869.

During the adverse times which succeeded the monetary crisis of 1866 the North Eastern Company had been obliged to revert to the old fares, but now that the heavier traffic returns gave satisfactory indications of a revival and development of trade, the Company were enabled to reduce the fares—to share, in fact, their prosperity with the public. On the 1st of January, 1870, the following scale of fares came into force, viz.:—2d. per mile first class, and 1½d. per mile second class, plus 5 per cent. government duty in each case, and 1d. per mile third class; return tickets (first and second class) were issued at the rate of a single journey fare and a half.

The North Eastern Railway stood out prominently at the beginning of 1870 as the “most prosperous of all our home railways.”* It had paid higher dividends on its ordinary stocks in 1869 than in any previous year, viz.:—Berwick 6½ per cent., York 6¼ per cent., Leeds 4⅓ per cent., Carlisle 8⅝ per cent., Darlington 9 per cent. and Thirsk and Malton 5 per cent. North Eastern stocks had risen steadily in value. Opening in 1869 at 100, 88 and 55½ respectively, Berwick, York and Leeds stocks had closed, twelve months later, at 126, 123½ and 83, having undergone not the slightest depreciation from the opening price during the whole of the year. Notwithstanding the great advance in price North Eastern stocks were declared to be “the most inviting railway investments in the kingdom.”† Unfortunately the North Eastern stocks presented certain perplexing variations which affected their position in the market. One stock for example was at a large premium, another at a heavy discount. While Berwicks, “the consols of railway property” in the estimation of the Stock Exchange, were readily negotiable, Carlises, a very valuable stock, did not always command a quotation. As the sectional dividends were liable to unequal fluctuations the relative market value of the several stocks varied in unequal degrees. The subject of amalgamating the stocks had been under the consideration of the directors for some years. The advantage of having one large North Eastern ordinary stock always standing at a premium instead of a number of sectional stocks at different prices was obvious. Equally obvious was the advantage to the Company of being able to raise additional capital by the issue of ordinary stock instead of having to provide for new expenditure by the issue of preference stock, especially as the amount of the latter stock in the Company was already disproportionate to the amount of their ordinary stocks. It was not, however, until November, 1869, that the directors were able to submit to the share-

* Pamphlet entitled “Railway Prospects in 1870.”

† *Ibid.*

holders a scheme of consolidation. No little difficulty had been experienced in arriving at a just estimate of the relative value of each separate ordinary stock. There were three factors which entered into the calculations—the actual dividend, the actual market value and the varying rate of possible increase or decrease of dividend. It was this third factor which really created the difficulty. Though the net revenue was divided in certain fixed proportions among the six sections of shareholders, the dividends fluctuated in varying degrees on account of the varying proportions in which the ordinary stocks stood to the preferential and guaranteed stocks in the several sections. The result was that an increase in the net revenue which gave an additional 20s. to the Berwick shareholders added 24s. 0½d. to the York dividend, 20s. 4d. to the Leeds, 25s. 6d. to the Darlington and 24s. 2d. to the Carlisle. Upon the dividend likely to be paid depended the solution of the question whether a section would gain or lose by consolidation. At 5 per cent. the Berwick, Carlisle and Darlington sections were losers and the York and Leeds sections gainers, at 6 per cent. the Berwick and Carlisle were losers and the York, Leeds and Darlington gainers, at 7 per cent. the Berwick, Carlisle and Darlington were gainers and the York and Leeds losers. The difficulty was to fix a fair regulating turning-point at which certain of the sections would begin to lose and the others to gain. Taking into account all the circumstances which were likely to affect the revenue the directors considered that it would not be prudent to fix the turning-point higher than 6¼ per cent. and they, therefore, calculated their scheme on the supposition that 6¼ was the average turning-point. Allowances were made for the effect on the Berwick section of the conversion of Great North of England purchase shares (4 per cent. guaranteed) and of the old Hartlepool Stock (8 per cent. guaranteed) into ordinary stock, and of the effect on the York section of the redemption of the Hull and Selby purchase, etc., shares (4½ per cent. on the amount called up and 5 per cent. on the amount paid in advance). The scheme of consolidation submitted by the directors after much weighing of claims and balancing of interests was one which dealt fairly and equitably with all sections of the ordinary shareholders. The proposal was to allot stock in the following proportions for every £100 of the existing nominal amounts—Berwick, £100; York, £98; Leeds, £65; Carlisle, £133; Darlington, £136; Malton, £10. The approval of the shareholders was given to the scheme on the 3rd of December, 1869, and an Act embodying and providing for the scheme received the Royal assent on the 12th of May, 1870.

This important measure may be regarded as the topstone of the work of amalgamation begun in 1853. The general opinion of its value was voiced by Sir William Wright, the chairman of the Hull Dock Company, in giving evidence before a Select Committee in 1872, that "it was one of the finest, one of the best financial operations which had taken place for a great number of years."* The amount of stock consolidated was £16,211.467 and the name by which it was designated in the Act was "North Eastern Consols."† The first quoted price of North Eastern Consols was 137½. The market value of the stock rose steadily until the 14th of June, 1870, when the highest quotation for the year was attained, viz., 149½. A large increase of £160,016 in the net receipts for the half year enabled the directors to declare their first dividend on North Eastern Consols at the handsome rate of 7¼ per cent. The dividend for the second half-year was 8½ per cent., so that for the whole year the ordinary shareholder got a return of 7½ per cent. on his capital.

The only new line added to the North Eastern system in 1870 was the short, but very costly, Quayside branch at Newcastle—a nearly semi-circular line, not quite a mile in length, running through tunnels and open cuttings on gradients of 1 in 27 and 1 in 30 from the old cattle dock at the Manors station to the Quayside, near the Hamburg wharf, where it was joined by a line laid along the quay by the Newcastle Corporation. It was opened on the 1st of June, 1870. The Merrybent and Darlington Railway, a feeder to the North Eastern Railway and now a part of the system, was also opened on the 1st of June as far as Barton (6½ miles). The line had been formed, according to the plans of Messrs. Nimmo and Macnay, the engineers, for the conveyance of copper and limestone from the mines and quarries of the Merrybent and Middleton Tyas Mining and Smelting Company. It crossed the Tees near the village of Cleasby by a fine iron lattice girder bridge, which had three river openings of 75 feet span each and two land-arches; each of the piers in the river consisted of a pair of cast-iron cylinders braced together. On the 1st of September,

* *Minutes of Evidence on Railway Companies Amalgamation, 1872, question 2,350.*

† According to the Chairman, speaking on the 12th of November, 1869, an opinion had long been held on the Stock Exchange that the Berwick stock was the Consols of railway property. In this statement, or in the statement attributed by *Herapath's Railway Journal*—on November 13th, 1869—to some member of the North Eastern Board, that the North Eastern ordinary stock was "another kind of consols," so solid was the basis on which it reposed, we probably have the origin of the term "North Eastern Consols." The term "Railway Consols" had been used as early as 1866 in connection with the Parliamentary notice of a company proposed to be incorporated for the creation and issue of consolidated railway annuities, *Herapath's Railway Journal, November 24th, 1866.*



From "*Engineering*," October 27th, 1871, p. 265.
SWING BRIDGE OVER THE OUSE AT NABUEN, NEAR YORK.

1870, the West Durham Railway was finally vested in the North Eastern Railway Company. By the end of the year the York and Doncaster branch was completed and, on the 2nd of January, 1871, this new link in the East Coast route was opened for traffic, shortening the distance between London and York by about three miles. The branch was in two sections, one extending from York junction to Barlby junction, $12\frac{3}{4}$ miles, and the other from Selby Station junction to Shaftholme junction, $14\frac{1}{4}$ miles, the latter being connected with the Lancashire and Yorkshire line near Hensall by a loop line half a mile in length. The line was carried over the Ouse at Naburn by a hydraulic swing bridge, which consisted of a fixed span and a movable portion, 176 feet in length, turning on a ring of rollers at the top of a many-cylindere pier similar to that of the Skelton Bridge, near Goole, on the Hull and Doncaster line; but, as the pier at Naburn stood on the north bank of the river, only half of the swinging portion bridged the waterway. Another new link in the East Coast route—the Team Valley extension—was rapidly approaching completion.

The whole of the lines for which the Company had obtained Acts of Parliament were now either in progress or about to be staked out and let to contractors. Parliamentary notices had also been given for lines which it was expedient the Company should make, if they were to keep the district in their own hands. One of these was a branch from Melmerby to Masham which the Company had pledged themselves to make on obtaining the consent of the inhabitants of the district to withdraw their opposition to the abandonment of the southern portion of the Hawes and Melmerby Railway.

By applying in 1871 for powers to construct a line along the north bank of the Tyne between Byker and Percy Main and a series of lines along the coast between Monkwearmouth and Ryhope and between West Hartlepool and Middlesbrough, the Company cut away the ground from under schemes which might afterwards have created difficulties. Of these schemes, one was for a line commencing at the Quayside, Newcastle, and running by way of St. Peters, Willington Quay and Northumberland Dock to North Shields; the other was for a direct line of railway communication between the Wear and the Tees, the proposal being to unite the Londonderry and South Hetton private railways by a short connecting-line between Seaham Harbour and Ryhope Colliery and to extend this composite line from Haswell to Norton Junction.

In promoting their Bill in Parliament the North Eastern Company encountered strong opposition from the Corporation and inhabitants of

Stockton who contended that the swing bridge by which it was proposed to cross the Tees at Billingham Reach would seriously obstruct the navigation of the river. The ironmasters of Middlesbrough were all in favour of the bridge, because it would facilitate their access to the Auckland and North Durham coal-fields and save nearly eight miles of carriage on their pig iron between Middlesbrough and West Hartlepool. The shipowners and merchants of Stockton, on the other hand, were opposed to the bridge, and the vigour with which they worked up the case against it was not, perhaps, without reason ascribed to jealousy of Middlesbrough. The final result of their proceedings was that Parliament refused to sanction the bridge. The branches that would have formed the approaches to the bridge were therefore abandoned. There was great jubilation in Stockton at the rejection of the bridge scheme, and when the Mayor of the town arrived from London the following day, the enthusiastic crowd took the horses out of his private carriage and drew him triumphantly home. The North Eastern Bill, as altered, received the Royal assent on the 13th of July, 1871.

Three short railways which now form part of the North Eastern Railway system were sanctioned this session, viz.:—

Name of Railway.	ACT.		Length of Line. Miles.	Capital Intended to be raised in Shares and by Loans. £
	Description.	Date of Royal Assent		
Hylton, Southwick and Monkwearmouth Railway* ...	33 Vic. cap. 13	25th May, 1871	4 $\frac{3}{4}$	66,000
Scarborough and Whitby Railway† ...	34 Vic. cap. 85	29th June, 1871	20	160,000
Scotswood, Newburn and Wylam Railway‡ ...	34 Vic. cap. 48	16th June, 1871	6 $\frac{1}{2}$	113,300
			31 $\frac{1}{4}$	339,300

Among the projects of 1870 which did not come before Parliament was one for a line from Stanhope to Alston. § Being inadequately supported, it

* Directors appointed by the Act: Robert Scott Briggs, Thomas Ridley Oswald, William Dodd Pratt, Hugh Stafford, William Stobart, Robert Thompson, Robert Thomas Wilkinson. First chairman: William Stobart.

† Directors appointed by the Act: Charles Bell, William Forster, William Henry Hammond, Sir Harcourt Johnstone, Bart., M.P., John Warrington. First chairman: Sir Harcourt Johnstone, Bart., M.P.

‡ Directors appointed by the Act: Thomas Bates, William Benson, John Spencer, Thomas Spencer, William Haswell Stephenson. First chairman, John Spencer.

§ *Darlington and Stockton Times*, April 16th and May 16th, 1870.

fell through. A line from Middleton-in-Teesdale to Alston was also promoted in 1871 under the name of the Cumberland and Cleveland Junction Railway,* but for this scheme, as for the other, it was found impossible to raise the necessary amount of capital. In the autumn of 1871 the project of an independent coast line between Sunderland and Middlesbrough was revived in West Hartlepool. After the rejection of the Tees bridge scheme, the North Eastern Company had been obliged to give up the idea of carrying the direct line through Hartlepool and to alter their plans so that, striking off from a point near Shotton in the Castle Eden district, the line should pass through Hutton Henry towards the old Tees bridge at Stockton. The position of Hartlepool was, therefore, that of a town on the loop, instead of on the main, line of the coast railway. Some of the leading merchants and manufacturers of Hartlepool raised the cry that the port was being neglected by the North Eastern Company. Then came the proposal to form an independent coast railway from Sunderland to Crimdon and from Crimdon southward by way of West Hartlepool to Haverton Hill, passing under the Tees by a tunnel to Newport where it was intended to form a junction with the existing line to Middlesbrough. It was further proposed to form a branch line from the Durham end of the tunnel to Stockton and Darlington, keeping in view the ultimate extension of this line from Darlington by way of Richmond and Askrigg to the Midland Railway at Hawes Junction.† The arrangements for going to Parliament with the scheme were not completed by the end of November, and the loss of a session proved fatal to it.

In 1871 the final steps were taken towards the unification of the North Eastern system. Previous to this year there was a considerable variation in the rates charged on similar traffic in different districts. This was owing to the number of lines which had been brought into the system. The prosperous circumstances in which the Company found themselves in 1871 enabled them to carry out a long considered scheme for the equalisation of the rates. Most of the rates were reduced, a few were raised and others left unaltered, some old agreements standing in the way of revision.

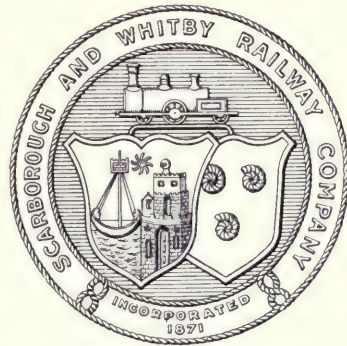
In the latter part of 1871 the North Eastern directors considered the time favourable for completing the purchase of the Hull and Selby Railway which still retained its position as a leased line, and on the 1st of September the requisite six-months' notice was given to the Hull and Selby Company.

* *Darlington and Stockton Times*, December 23rd and December 30th, 1871.

† *The Engineer*, October 20th, 1871; *Darlington and Stockton Times*, November 4th, 1871.

A few miles of new railway were added to the North Eastern system during the latter part of 1871, viz., the Gilling and Helmsley branch (5 miles) and the Raskelf curve ($\frac{1}{2}$ mile), both opened for traffic on the 9th of October. At the end of the year the total length of the North Eastern Railway was 1,314 miles. The gross receipts for the year amounted to no less a sum than five million pounds, the expenditure to two millions and a quarter, and the net receipts to two millions and three quarters. A dividend of $8\frac{1}{4}$ per cent. for the first half of the year, and of 10 per cent. for the second half gave an average dividend for the year of $9\frac{1}{8}$ per cent. At the turn of the year North Eastern consols stood at 185 $\frac{1}{2}$ and on the 3rd of January, 1872, reached the record point of 187 $\frac{1}{2}$.

Probably the principle of amalgamation had never been so fully justified as in the case of the North Eastern. The Legislature had with considerable misgivings sanctioned the union of the three companies forming the North Eastern Railway Company. Again and again had the question been raised whether the results of amalgamation, from the public point of view, were beneficial or not. Finally, but a few months after a dividend at the rate of 10 per cent. per annum had been declared by the North Eastern Company, a Parliamentary inquiry took place on the subject of railway amalgamation. What were the conclusions of the Committee? In their report they stated that "the balance of advantage to the public as well as to the share-



SEAL OF SCARBOROUGH AND WHITBY RAILWAY COMPANY.

holders may even well be thought to be on the side of amalgamation," adding, "the case of the North Eastern is a striking illustration. That railway, or system of railways, is composed of 37 lines, several of which formerly competed with each other, and before their amalgamation they had, generally speaking, high rates and fares and low dividends. The system is now the most complete monopoly in the United Kingdom; from the Tyne to the Humber, with one local exception, it has the country to itself and it has the lowest fares and the highest dividends of any large English railway; it has little or no litigation with other companies. Whilst complaints have been heard from Lancashire and Yorkshire, where there are so-called competing lines, no witness has appeared to complain of the North Eastern, and the general feeling in the district it serves appears favourable to its management."

CHAPTER XIX.

A CHANGE OF FORTUNE.—FROM 10 TO 5 PER CENT.

[1872-1879.]

With the year 1872 we enter upon the modern period of our history—the period of the steel track, the block system, the continuous brake, the bogie carriage. Mr. Henry Tennant had succeeded Captain O'Brien* as general manager and Mr. Christopher Newman Wilkinson had taken the place of Mr. Cleghorn as secretary. Mr. Thomas Cabry, the engineer of the southern division, had resigned and other staff changes were imminent. The chequered career of George Hudson had just come to an end, and his death, on the 14th of December, 1871, recalled events which were almost ancient history. Yet the railway of 1871, in its general characteristics, was not so very different from the railway as George Hudson left it in 1850. Steel rails had been laid down on the High Level Bridge at Newcastle in April, 1862,† and somewhat later, rails of the same material had been used at points and crossings and on portions of the line where a great deal of shunting took place, but, with these exceptions, the permanent way of the North Eastern Railway was still of iron. About a hundred miles of the main line consisted of iron rails hardened by Dodds' patent steeling process, which had been adopted in 1860 and used for several years, but afterwards discontinued owing to the occurrence of breakages resulting from the excessive hardening of the surface of the rails.‡

* Captain William O'Brien, 5th son of Lucius O'Brien, Esq., of Cratloe House, County Clare, Ireland, was secretary of the Great North of England Railway from 1841 to 1845. From 1845 to 1850 he occupied a similar position on the Wilts, Somerset and Weymouth Railway. In 1850 he returned to the North of England as secretary of the York, Newcastle and Berwick Railway, and, in October, 1854, was appointed general manager of the North Eastern Railway. He retired from that position on the 25th February, 1871. A testimonial, consisting of an illuminated address, and a silver centre-piece, was presented to him by the Company's servants on the 14th of September 1871, the number of subscribers being 5494. Within a year afterwards, on the 6th of September 1872, Captain O'Brien died in London at the age of 64.

† *Newcastle Courant*, April 18th, 1862. They were the first steel rails rolled in the North of England, and were manufactured at the Weardale Iron and Coal Company's works at Tudhoe by the newly invented Bessemer process.

‡ *Trans. of Inst. of Civ. Engineers*, vol. 42, p. 123. The patentee, Isaac Dodds (born Felling Hall, 1801) was one of George Stephenson's first apprentices at the Newcastle engine works.

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PLATE XXXIV.



Henry Tennant—General Manager, 1871-1891.

Except on little used inclines and sidings, it was now difficult to find examples of the early light rails of refined iron, which, in quality, so far surpassed the rails of later date. The last portion of the old Hull and Selby Railway on longitudinal bearings had been taken up in 1860.* The original rails of the Newcastle and Darlington Junction and Newcastle and Berwick Railways, which weighed 65 lbs. to the yard, had been replaced by rails of a heavier section, and the permanent way from Berwick to Shaftholme Junction was now uniform in character. Creosoted sleepers had been used exclusively in the renewal of the permanent way since 1859.

By 1872 all the junctions on the main line, as well as on the principal branches, were provided with apparatus for wedging facing-points, a mechanical improvement introduced by Mr. T. E. Harrison in 1869, which diminished the risk of accidents and facilitated the working of the traffic. Facing-points ceased to be dreaded, and the back shunting of trains to avoid them fell into disuse.

The points to which Mr. Harrison applied the principle of wedging were, in all cases, interlocked with the signals. Points and signals, however, were not generally interlocked on the North Eastern lines until 1871. It was the occurrence of two serious accidents—one at Thirsk on the 9th of May, 1869, and the other at Brockley Whins on the 6th of December, 1870—which drew the attention of the directors to the danger of leaving important junctions without the protection afforded by the interlocking system. At both places the accident was due to inadvertence—at Thirsk, on the part of a signalman, who, forgetting that the points were still set for a siding, had lowered his signals for the Scotch express: at Brockley Whins, on the part of a pointsman, who had neglected to close the points of a cross-over road after allowing a train to pass through them. The absolute block system had been applied to 48 miles of line on the North Eastern Railway previous to 1871—between Shildon and Darlington as early as October 31st, 1865†—and at the time

* *Trans. of Inst. of Civil Engineers*, vol. 20, p. 279.

† The system was worked by Walker's patent electro-magnetic telegraph semaphores under the following general regulations for signalling trains or engines:—

- (1) Every Train or Engine must be signalled as "Leaving" to the next Station before it *leaves or passes* a Station.—The Train or Engine must not be started, or allowed to pass, until the next Station has *taken* the "Leaving" signal. The Company's Servant who gives the "Leaving" signal for a Train must remain on duty until he knows that the "Arrived" signal of the same has been taken.
- (2) Every Train or Engine that *arrives at or passes* a Station is to be immediately signalled back "Arrived" to the last Station, after it has been clearly ascertained, by *actually seeing the signal on last vehicle*, that no portion of the Train from any cause has been left behind.
- (3) No second Train or Engine is to be allowed to follow until the "Arrived" signal of

of Captain O'Brien's retirement, preparations were being made to apply it to other 33 miles of line.* Notwithstanding the extent of these experiments it is doubtful whether the North Eastern Board contemplated at first more than a very partial application of the block system to their lines,† but by May, 1871, they had taken a larger view of the subject and decided that the whole of the railways should be worked under the block system.



SHILDON SORTING SIDINGS.

Arrangements were further made for the establishment of classes in which pointsmen, signalmen and other servants of the Company might be instructed and trained to perform efficiently the duties required of them.‡

- the *previous* Train or Engine has been taken.
- (4) The "Leaving" signals of *passing* Trains are to be made as they *approach*, in order to let them pass without check *if the line is clear*.
 - (5) No Signal *given* by one Station is complete until *taken* by the other Station *acknowledging* it. If the Signal is not *acknowledged*, it must be given again until it is.
 - (6) Should a Train arrive at either signal station without the proper signal on the last vehicle, the Signalman will immediately give the "Danger" signal of Five Blows to the signal station in the rear, and will not again give the "Clear" signal till he is informed by a properly authorised Servant of the Company that the line is clear.

* Chairman's speech, Feb. 17th, 1871. *Newcastle Daily Journal*, Feb. 18th, 1871.

† Evidence of Captain O'Brien before Select Committee on Compensation for Railway Accidents, June 16th, 1870.

‡ *Darlington and Stockton Times*, May 6th, 1871.

The system of shunting by gravitation had reached an advanced stage of development on the North Eastern Railway previous to 1872. At Tyne Dock the whole of the movements of the waggons from the time when they were deposited in the reception sidings to the time when they stood empty, waiting for the locomotive engines to take them back to the collieries, had been effected since 1859 by gravitation. At Shildon shunting by gravitation had been practised from an early period in sidings laid down without any preconceived plans, but it was not until 1869—after the completion of additional groups of sidings and the re-arrangement of the old lines—that Shildon became noted for the extent to which this system was applied in the marshalling of trains. The aggregate length of single line in the Shildon sidings, engine-running lines and cross-over roads, at this time was upwards of $10\frac{1}{2}$ miles and the space occupied about 16 acres. About 2,000 trucks and waggons on an average, consigned to 200 different points of delivery, passed through these sidings per day of 24 hours, the cost of collecting, sorting and marshalling them into train being a little more than $\frac{1}{4}$ d. per ton of minerals conveyed.*

Since 1863 the Company had provided about 100 miles of additional sidings at a cost of £156,000† to meet the requirements of the expanding traffic which, in 1870, showed an increase of ten million tons of goods and minerals over the total quantity carried in 1860.‡ At Newcastle the old goods station of the Newcastle and Carlisle Railway Company at the Forth Banks (opened 2nd January, 1854) had been removed, and the present Forth Goods station (opened for the traffic of the Carlisle section on the 3rd of March, 1871) built upon its site. New goods stations were in course of erection at this time at Middlesbrough and Leeds (Marsh Lane). The Darlington and Thirsk passenger stations had been rebuilt and Normanton Joint Station enlarged. Alterations had taken place at Newcastle Central Station with the object of securing increased safety and accommodation. The first of these was the lowering of the level of the rails in 1866 to increase the height of the platforms from 15 inches—the original height—to 3 feet;§ the second, the construction of an island platform on the south side of the station in 1871. At York the traffic had long outgrown the narrow limits of the old station and preparations were being made to build a more commodious station—three times the length of the old one—outside the City Walls, with hotel of palatial dimensions beside it.

* *Proc. of Inst. of Civil Engineers*, vol. 41, pp. 21 and 22.

† Chairman's speech, half-yearly meeting, August 18th, 1871.

‡ *Ibid.*, Feb. 17th, 1871.

§ *Proc. of Inst. of Civil Engineers*, vol. 25, p. 280.

Comparing the rolling stock of 1871 with that of Hudson's time, we find that most of the lighter engines of that period had disappeared to make way for engines of a larger class. By these replacements the Company had added considerably to the nominal power of their locomotive stock—in one period of seven years, 1858-65, this increment is stated to have amounted to 40 per cent.*—but the new engines did not exhibit any other striking varia-



From "*The Illustrated London News*," July 7th, 1866.

FIRE AT THE HIGH LEVEL BRIDGE, NEWCASTLE-UPON-TYNE.

tions from previously existing types. It may be doubted whether any of the later engines could have improved upon the record of Hawthorn's "Richmond," which took seven carriages from Darlington to York ($44\frac{1}{2}$ miles) in August, 1845, at an average speed of 57 miles an hour, or on the records of Stephenson's three-cylindered engine No. 77 and patent express engine No. 190, which drew the Queen's train from Berwick to York on the 11th of October, 1850, at an average speed (exclusive of stoppages) of 57 miles an

* *Proc. of Inst. of Civil Engineers*, vol. 24, p. 493.

hour from Berwick to Newcastle (67 miles) and of 51 miles an hour from Newcastle to York (81 miles). When, on Sunday, the 24th of June, 1866, the High Level Bridge at Newcastle was in danger of destruction from the flames of a burning mill beneath it, and a special train ran from London to Newcastle for the purpose of conveying Mr. T. E. Harrison to the scene of danger, it was an engine of 1848, Hawthorn's "Plews" (No. 180) which drew the "special" from York to Darlington and an engine of still earlier date—so it is stated—which brought the train on from Darlington to Gateshead. The engines which draw the main line expresses during the years immediately preceding 1872 were those of class 544 (Nos. 544-53) six-wheeled, four-coupled engines, weighing 34 tons in working order, built in 1865 and 1866 by R. & W. Hawthorn from the designs of Mr. Edward Fletcher.* These, with the engines of the 162, 257, 675 and 686 classes, although heavier and of greater power than the four-coupled engines of 1851 and 1853—the "Hackworth" (A. Kitching) and No. 215 (E. B. Wilson & Co.) for example—did not mark any particular advance in design upon the earlier engines. The diameter of the coupled wheels in the 544, 162, and 257 classes was 6 feet 6 inches, in class 686 6 feet, and in class 675 5 feet 6 inches. The load they were required to haul varied from six to twelve vehicles. The express, which was switched into a siding at Thirsk on the 9th of May, 1869, consisted of five composite carriages, four third-class carriages, two vans, and one fish waggon. The "Flying Scotsman," which was partly derailed near Belmont Station on the 12th of October, 1871, consisted of two composite carriages, two first-class carriages, and two vans.

The express engines with single driving wheels, of a later date than 1854, belonged entirely to the 450 class. They were built, with one exception, between 1861 and 1863, on the same general lines as those of class 220, which began running in 1854. This type of engine proved a very serviceable one, but the four-coupled type was in the ascendant, and after 1863 engines with single driving wheels ceased—for several years at least—to be built on the North Eastern Railway. The locomotive stock of the North Eastern Railway at the beginning of 1872 included a few examples of bogie and tank engines, specially designed to work heavy gradients. The first of the bogie engines, as already shown, were the "Brougham" and the "Lowther," which began running between Darlington and Tebay in 1861.

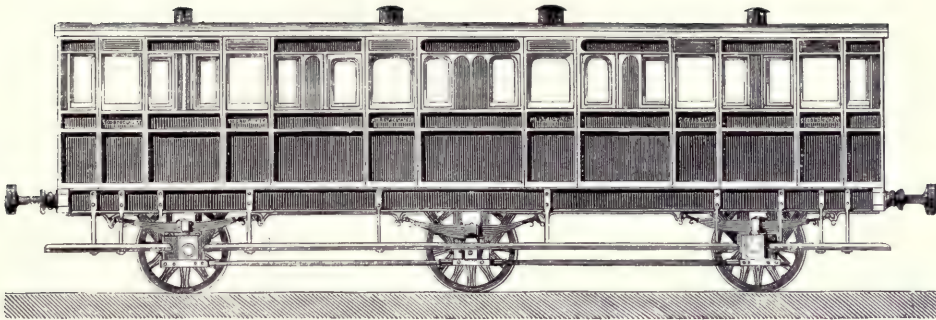
* It was an engine of this class, No. 549, which, when drawing the "Flying Scotsman" on the 12th of October, 1871, left the rails near Belmont Station, owing to the fracture of a tyre on one of the wheels.

They were followed in 1862 by the "Saltburn," the "Morecambe," the "Belfast," and the "Keswick," which had coupled wheels of 7 feet instead of 6 feet diameter, steam-brakes instead of the ordinary screw-brakes, and cabs of a different form from those of their predecessors. In 1864 appeared the first three (Nos. 492-4) of a set of bogie engines with coupled wheels of 5 feet diameter, designed by Mr. Fletcher, to work the passenger trains on the Whitby line. Seven others of this class (Nos. 495-501) were built in 1865. In 1871 appeared the first of "Ginx's Babies" (No. 238 S. & D, afterwards 1238



THE FIRST OF THE SO-CALLED "GINX'S BABIES."

N.E.R.), designed by Mr. William Bouch to work the passenger trains on the Darlington and Tebay line, having coupled wheels of 7 feet diameter and (for that period) a remarkable piston stroke of 30 inches. While the "Brougham" of 1860 weighed $32\frac{1}{4}$ tons, this engine of 1871 weighed $41\frac{1}{4}$ tons. The six-coupled tank engines constructed for working heavy inclines were known as "saddlebacks." Of these, Nos. 518 and 519, built by Manning, Wardle & Co. in 1864, and Nos. 575 and 576—ordinary goods engines built by R. & W. Hawthorn in 1866 and converted into tank engines—were employed on the Quayside branch at Newcastle, and No. 196 "Roseberry,"



From "The Engineer," June 2nd, 1865, p. 344.

SIX-WHEELED COMPOSITE CARRIAGE WITH RADIAL AXLES,
WEST HARTLEPOOL RAILWAY, 1865.



FOUR-WHEELED THIRD-CLASS CARRIAGE, NORTH EASTERN RAILWAY, 1869-71.

[SIX COMPARTMENTS—LOW PARTITIONS].

No. 197 "Kildale," No. 198 "Whitby" and No. 199 "Escomb" built by R. Stephenson & Co. in 1866, worked the curious zigzag inclines at Skinnin-grove. Other "bank" engines of the tank type were Nos. 663 and 664, built by Hudswell, Clark & Co. in 1866. Some of the heaviest goods and mineral engines of the North Eastern Railway were to be found on the Stockton and Darlington section. Of these, the most powerful, perhaps, and certainly the most striking in appearance, belonged to a class designed by Mr. William Bouch in 1865. A representative example (No. 191 S. & D.), "Autumn," was placed on the line in April, 1866. The principal dimensions of these engines were: Boiler, 14 feet 6 inches in length, with a mean diameter of 4 feet; cylinders, 17 inches in diameter, with a stroke of 26 inches; wheels, six in number, coupled. They weighed $37\frac{1}{2}$ tons each and had a total heating surface of 1,432 square feet.* Novelties of detail which gave them a special interest were Bouch's screw reversing gear and the feed-water heating apparatus. The type of engine which commended itself to Mr. Fletcher at this time for heavy traffic was that of Nos. 642-661, built by R. Stephenson & Co. in 1866-7, and of Nos. 572-583, built by R. & W. Hawthorn in 1866, a six-coupled type with wheels of 5 feet diameter and cylinders 17 inches by 24 inches. Some years previous to 1872 the locomotive engines of the North Eastern Railway had been constructed to burn coal instead of coke. Of the amount spent in fuel by the Company in 1863, 96 per cent. was for coke and 4 per cent. only for coal; in 1871, 33 per cent. of the amount spent in fuel was for coke and 67 per cent. for coal.

The North Eastern Railway carriage stock of 1872 showed an appreciable advance in comfort and accommodation upon that in service at the time of the amalgamation, though most of the vehicles were still of the short four-wheeled type. The older first-class carriages had been converted into second-class, and in some cases into third-class carriages, and vehicles of an improved type had taken their place. The third-class carriages constructed between 1869 and 1871 gave more space to the passenger, especially between the seats, and were better lighted than those constructed twenty years earlier, but they still retained the antiquated feature of low partitions between the compartments. On the little Blyth and Tyne Railway, which was yet independent of the North Eastern Railway, third-class carriages were running of a type unsurpassed, perhaps, in the Kingdom. Designed in 1854, they had given

* *Locomotive Magazine*, April 11, 1903, p. 254.

such general satisfaction that neither the directors of the line nor the public desired a change of type.* Those delivered in 1864 were built entirely of mahogany,† One new type of carriage the North Eastern Company took over from the West Hartlepool Harbour and Railway Company. This was a long composite carriage with two first and four second-class compartments running on three pairs of wheels, the two end ones provided with radial axle-boxes to enable the carriage to travel round the curves of the short loop line between East and West Hartlepool, which, at the time, skirted the southern and eastern sides of the slake. The wheel-base of the carriage was 23 feet and the length over all 37 feet.‡ A carriage had been fitted up as a smoking saloon, with table and other conveniences for the accommodation of first-class passengers, on the Tynemouth branch as early as the spring of 1856.§ After the 1st of October, 1868, smoking compartments became general on the North Eastern Railway, for the Company were required by the Regulation of Railways Act of that year to provide such compartments on every passenger train containing more carriages than one of each class, unless exempted by the Board of Trade. The carriages running on the East Coast trains had been built in the Great Northern shops, and were held jointly in certain proportions by the Great Northern, the North Eastern and the North British Companies. They formed the East Coast joint stock which, in 1861—when the original stock was built—consisted of 50 vehicles; in 1865 of 63 vehicles, and in 1873 of 89 vehicles.

The waggon stock illustrated, in two of the newer types, the growing tendency towards increase of capacity and diminution of dead weight. Since 1856 8-ton waggons, with wrought-iron wheels, springs, spring buffers and spring draw-bars had been gradually replacing the old chaldron waggons, and now 10-ton waggons were being used. Still sixty per cent. of the mineral waggon stock consisted of chaldron waggons with cast-iron wheels and inside journals, and without either bearing or buffer springs. At the beginning of 1872 there were 3,950 8-ton coal waggons in stock and 9,953 large mineral waggons. The effect of this introduction of a larger type of waggon, so far as it related to the ironstone traffic, was thus described by *Engineering* in 1866:—"Forty-five of the old waggons were held to make a good train, but they carried in all but 150 tons of ironstone, whereas 24 of the new waggons carry 240 tons and run at increased speed."|| The coal

* *Newcastle Chronicle*, September 1, 1874.

† Chairman's speech, half-yearly meeting, August 22, 1864.

‡ *The Engineer*, 1865, p. 344. § *Darlington and Stockton Times*, April 5th, 1856. || p. 404.

trains running from Usworth to London in 1870 consisted of 30 of these 10-ton waggons.* When it is remembered that the output of Cleveland ironstone in 1871 was nearly four and three quarter million tons, that between six and seven million tons of coal and lime were required to smelt this vast quantity of stone, that the production of pig-iron in the Cleveland district was close upon two million tons, some conception may be formed of the demands made on the North Eastern waggon stock. Engines, carriages and waggons numbered in all, at the end of 1871, 66,928. which, if placed on one line, would have more than covered the distance from Berwick to Doncaster.

A comparison between the time-tables of 1854 and 1866 shows how little improvement had been made in the main line train service during an eventful period of North Eastern history. From the following tables it will be observed that the running time of some of the trains remained unchanged.

RUNNING TIME OF PRINCIPAL EXPRESS TRAINS.

Up Trains.				Scheduled Time of Running.			
				Berwick to Newcastle, 67 Miles.		Newcastle to York, 81 Miles.	
				hr. min.	No. of Stoppages.	hr. min.	No. of Stoppages.
Day Express	—Leaving Berwick	11·25 a.m.	1854 ...	1 45	3	2 20	3
Do.	do.	11·55 a.m.	1866 ...	1 45	3	2 18	3
Day Mail	—Leaving Berwick	8·35 p.m.	1854 ...	2 10	4	2 50	2
Do.	do.	8·35 p.m.	1866 ...	2 10	4	2 50	2
Night Mail	—Leaving Berwick	3·14 p.m.	1854 ...	2 16	7	2 19	3
Do.	do.	4·30 p.m.	1866 ...	2 3	4	2 20	4
Night Express	—Leaving Berwick	11·15 p.m.	1854 ...	2 0	1	2 40	2
Do.	do.	12·2 a.m.	1866 ...	1 48	—	2 15	1

RUNNING TIME OF PRINCIPAL EXPRESS TRAINS.

Down Trains.				Scheduled Time of Running.			
				York to Newcastle, 81 Miles.		Newcastle to Berwick, 67 Miles.	
				hr. min.	No. of Stoppages.	hr. min.	No. of Stoppages.
Day Express	—Leaving York	2·40 p.m.	1854 ...	2 15	3	1 40	2
Do.	do.	2·25 p.m.	1866 ...	2 10	3	1 50	3
Passenger Fast	—Leaving York	9·0 a.m.	1854 ...	2 30	6	1 55	3
Do.	do.	9·0 a.m.	1866 ...	2 30	7	1 55	3
Night Mail	—Leaving York	4·45 a.m.	1854 ...	2 15	4	2 15	7
Do.	do.	3·41 a.m.	1866 ...	2 17	4	2 15	8
Night Express	—Leaving York	2·40 p.m.	1854 ...	2 28	3	1 54	2
Do.	do.	2·45 p.m.	1866 ...	2 15	1	1 48	1
Special Scotch							
Express	—Leaving York	—	1854 ...	(not running in 1854)			
Do.	do.	3·0 p.m.	1866 ...	1 55	(between York & Newcastle only)		

* *Darlington and Stockton Times*, October 8th, 1870.

What we have called the modern period of our history opened with an agitation amongst several sections of the Company's servants for higher wages and improved conditions of service. In the latter part of 1871 the signalmen at the more important junctions on the railway secured a reduction of their standard hours. In January, 1872, the standard hours of certain engine-drivers and firemen were reduced and, two months later, improved scales of wages were granted to signalmen, guards, porters, ticket-collectors, shunters, horse-drivers and policemen. This period also opened with the improvement of the East Coast route by the substitution of the Team Valley branch, a portion of the Bishop Auckland branch and the Ferryhill extension line for the old series of lines between Gateshead and Ferryhill, the East Coast express trains beginning to run by way of Durham instead of Leamside on the 15th of January, 1872; the works, however, were not completed at that time, the final opening of the Ferryhill extension line ($6\frac{1}{2}$ miles) as well as of the additional sets of rails between Newton Junction and Durham station, and between Hoggersgate Junction and Ferryhill station, taking place on the 1st of March. The works comprised a deep cutting through a bed of sandstone at Croxdale Bank, and two lattice-girder viaducts, one over the Wear near Croxdale and the other over the Dearness Valley at Langley Moor. The Pelaw and Jarrow branch, giving direct communication between Newcastle and South Shields, was also opened on the 1st of March. Great difficulty had been experienced in forming the embankment which carried the railway over the estuary of the river Don. Only by depositing a vast quantity of ballast on this unstable site did the engineers succeed in obtaining a firm foundation for the line. To the list of lines opened in 1872 must be added the Newbiggin extension of the Blyth and Tyne Railway ($3\frac{1}{2}$ miles), which was opened on the 1st of March.

The chief works in progress at this time were the Boroughbridge and Knaresborough, the Leeds and Wetherby, and the Helmsley and Pickering branches. The Whitby, Redcar and Middlesbrough Union,* the Scarborough and Whitby,† the Hylton, Southwick and Monkwearmouth,‡ and the Scotswood, Newburn and Wylam Railways§ were also in progress in the hands of independent companies. On the 1st of June, 1872, the Saltburn extension line ($3\frac{1}{4}$ miles) connecting the Redcar and Saltburn branch with the Cleveland Railway near Brotton was opened for mineral traffic. A picturesque

* First sod cut, May 25th, 1871.

‡ First sod cut March, 1872.

† First sod cut, May 4th, 1872.

§ First sod cut, May 17th, 1872.

feature of the line was a brick viaduct of eleven arches, about 150 feet in height and 783 feet in length, which carried the line over the Skelton Beck near Saltburn. Some of the gentlemen of the district, headed by Mr. Joseph Dodds, M.P., proposed to connect the Saltburn extension line with the Castleton and Grosmont line by means of a short railway about $10\frac{1}{2}$ miles in length between Brotton and Glaisdale, and a Bill to carry out this scheme came before Parliament in the session of 1872, but owing to the opposition of the Whitby, Redcar and Middlesbrough Union Company and Mr. J. T. Wharton, it was rejected. An application by the North Eastern Company



From "Views of Saltburn and Neighbourhood," 1872.

VIADUCT OVER SKELTON BECK NEAR SALTURN.

for powers to make a line from Wellfield to Stockton, which would improve the communication between the Wear and the Tees and complete the direct route from Sunderland to Leeds, met with the approval of Parliament, and the passing of the measure gave the *coup de grâce* to the competing schemes which were being promoted in the district.

One of the most significant facts which marked the year 1872 was the changed attitude of the Railway Companies to third-class passengers. From a very early period revenue statistics had pointed to the desirability of giving increased facilities to this rapidly growing class. One of the first companies to realise the value of numbers at low prices in railway travelling was the little Blyth and Tyne Company, who gave notice in September, 1864,

that "on and after the 1st of October third-class tickets would be issued for *all* trains." It was thought at first that the shareholders were making a great sacrifice, but in less than six months the results of the experiment were admitted to be beneficial to the shareholders as well as to the public.* The concessions made by the North Eastern Railway Company consisted of: (1) Return tickets at a fare and a half on the 1st of January, 1872;† (2) third-class carriages attached to all but a very few of the express trains on the 1st of April; and (3) monthly third-class excursion tickets and residential third-class periodical tickets on the 1st of June.

The only through express train from which third class passengers were excluded was that leaving London at 10 a.m., but on the 1st of June, the East Coast Companies improved the service by adding a supplementary train, available for all classes of passengers, at 10.10 a.m., timed to perform the journey in 10 hours and a half. They accelerated the 10 a.m. train to reach

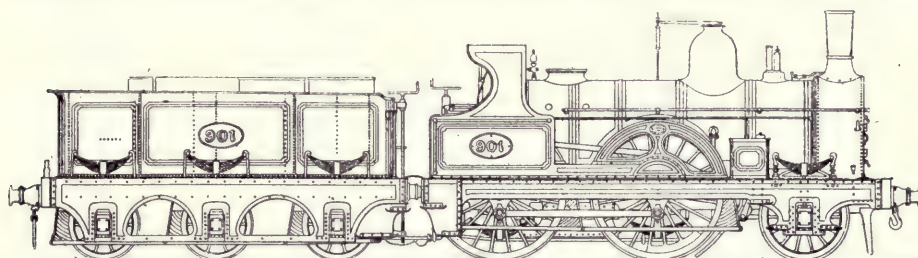


FIG. 1.

From "The Locomotive," Feb. 15th, 1910, p. 33.

EXPRESS PASSENGER ENGINE No. 901.

Edinburgh in nine hours and a half, allowing 25 minutes at York for lunch. They also put on an additional train at the northern end of the route, leaving Edinburgh at 10.25 a.m., and arriving at London at 8.25 p.m. Some curiosity was shown as to whether the East Coast Companies would succeed in running the 10 a.m. train in the reduced time. On the first day of the improved service, the train reached York a few minutes before the advertised time—a distinct benefit to diners. At Edinburgh the train arrived two minutes before the advertised time, the whole journey having occupied 9 hours 28 minutes. The East Coast service of trains was now one of the fastest in the world. Heavier loads and higher speeds required larger engines, and to meet the

* Chairman's speech, half-yearly meeting, February 20th, 1865.

† Four months afterwards increased to a fare and two-thirds. See p. 663.

demand for power and speed, Mr. Fletcher designed the famous 901 type of express engine with four-coupled driving-wheels, 7 feet in diameter, weighing from 39 to 40 tons. The first engine of this class—No. 901—began running in October, 1872. As the average number of vehicles composing the Scotch express leaving York for Edinburgh at 3 p.m. was six carriages and two vans between October, 1872, and July, 1873,* this may be taken as the measure of the work required of these engines at this time.

When the accounts of the first half-year of 1872 came to be made up it was found that the Company had not suffered by their concessions. The receipts from first class passengers showed an increase of $12\frac{1}{2}$ per cent., those from second class passengers a decrease of $16\frac{1}{2}$ per cent., and those from third class passengers an increase of 34 per cent., this increase being three times the amount that had been lost on the second class traffic.

For several half-years the working expenses had been advancing on nearly parallel lines with those of the gross receipts. The rate of increase was in one half-year a little more, in another half-year a little less than that of the gross receipts, but now the working expenses exhibited a tendency to shoot ahead. While the increase in gross receipts during the first half of 1872 was equivalent to $8\frac{1}{4}$ per cent., that of the working expenses was equivalent to $13\frac{1}{2}$ per cent. This disproportionate increase of the working expenses was chiefly due to the general advance in the rate of wages and the "unprecedented rise in the price of fuel." The net revenue, however, was still sufficiently large to enable the Company to pay a dividend at the rate of $8\frac{1}{2}$ per cent. per annum— $\frac{1}{4}$ per cent. more than in the corresponding period of 1871.

The principal railway companies became alarmed at the startling rise in prices, and realised that something would have to be done to restore the ratio between working expenses and gross receipts to its normal level. At a meeting of representatives of the railway interest held in July, the following resolution was passed: "That the cost of working railway traffic has been so greatly enhanced by the recent rise in wages and price of materials as to render necessary an immediate advance in the charges for railway conveyance." The North Eastern directors deferred acting upon this resolution as long as they possibly could, but when they came to open the tenders for a future supply of coal and found that the lowest price quoted showed an increase of 200 per cent. on the prices which prevailed twelve months before, they fell into line with the other companies and announced their intention of raising the rates for certain

* *Proc. of Inst. of Civil Engineers*, vol. 37, p. 37.

classes of traffic—the advance varying from $12\frac{1}{2}$ to 15 per cent.—and of increasing the price of return tickets from a fare and a half to a fare and two-thirds. This announcement called forth a vigorous protest from the freighters of Middlesbrough, who, having failed to convince the directors that the alteration was unnecessary, formed themselves into an association “for the protection of the interests of traders in all matters relating to railway rates, fares, and arrangements.” The increase in the return fares came into force on the 1st of September and the increase of the rates on the 1st of October.

The accounts for the second half of 1872 showed that the directors had based their action on reliable data. While the gross receipts were larger by £207,049 [= $7\frac{3}{4}$ per cent.], the working expenses exceeded those for the corresponding period in 1871 by £238,527 [= $19\frac{3}{4}$ per cent.]. The additional cost of coal and coke amounted to £97,943, of which sum £87,000 was due to advanced prices. The Company had performed a great deal of additional work during the half year from which they received no benefit whatever—and that in a time of extraordinary commercial activity. They had even to submit to a reduction in the rate of dividend of a half per cent. The return to the shareholders on their capital for the whole year was 9 per cent., as against $9\frac{1}{8}$ in 1871.

During the autumn of 1872 a sudden increase in traffic in the Hull district had caused something like a deadlock. The Company here, as at other places, suffered from the want of terminal accommodation, and found difficulty in dealing with the great influx of traffic. The sidings at Hull were at times blocked with loaded waggons, and vessels could neither receive nor discharge cargoes. The North Eastern Company at once took steps to increase the accommodation; but, in the meantime, the merchants and shipowners of Hull, raising the cry that the trade of the port was in danger, started a movement for the introduction of another railway into Hull. A line was proposed, commencing on the east side of Hull and sweeping round the town to Hessle, passing thence by a tunnel a mile and five-eighths in length under the Humber to Barton and proceeding up the Ancholme Valley to the Manchester, Sheffield, and Lincolnshire Railway, near Brigg, with a branch to join the Trent line of the same railway near Appleby. The scheme was launched under the title of the Hull South and West Junction Railway with a capital of £960,000. A Bill was introduced into Parliament by the promoters of the line and 10,000 of the inhabitants of Hull signed a petition in favour of it. The Bill passed the

House of Commons, but was rejected by the House of Lords, chiefly, if not wholly, on engineering grounds. These proceedings were the means of bringing about a cordial understanding between the North Eastern and Manchester, Sheffield, and Lincolnshire Companies as to the position of the latter Company at Hull. Under an agreement dated the 11th of July, 1873, the North Eastern Company granted to the Manchester, Sheffield and Lincolnshire Company running powers into Hull for passenger and goods as well as mineral trains, with facilities for the conveyance of their traffic to and from Hull. The original intention of the Sheffield Company was to have an independent goods station of their own at Hull. Subsequently, at the suggestion and through the intervention of Mr. A. C. Sherrieff, M.P., the North Eastern Company agreed to build, on land of their own adjoining Kingston Street, a large warehouse for the exclusive use of the Sheffield Company; the latter paying interest on the outlay in the form of a fixed annual rent and having secured to them entire independence in the development of their traffic.* The agreement came partially into force on the 1st of August, 1873, when the Sheffield Company began running their passenger trains into the Paragon Street Station.†

One of the unsuccessful measures of 1873 was a Bill promoted by the Midland and Manchester and Sheffield and Lincolnshire Railway Companies, with the double object of giving the latter Company access to London independently of the Great Northern Railway, by means of a joint line between Askern and Rushton, near Kettering, and of improving the connection between the Midland and North Eastern systems. The first object of the Bill was one which did not directly concern the North Eastern Company, the second was one which met with their cordial approval. Notwithstanding the alterations and extensions made to the joint station at Normanton in 1867-8, it was still a very inconvenient point of exchange for goods and passengers, trains being constantly delayed owing to the congested state of the traffic. The idea of making a direct line between Swinton and Knottingley was afterwards suggested to Mr. Allport by Mr. T. E. Harrison, who pointed out that, as the Great Northern Company had transferred nearly the whole of their traffic from the York and Knottingley to the York and Doncaster line, the Midland Company would have an unobstructed route from Sheffield to York. Mr. Allport at once recognised the advantage of such a line, and, finding that the North Eastern Company were willing to

* *Minutes of Evidence on the Hull and Barnsley Railway Bill*, 1880, pp. 775-779.

† *Ibid.*, p. 775, Question 9115.

exchange running powers to York for running powers to Sheffield, submitted the plan to the Midland Board; the result was an arrangement between the two Companies to deposit a joint Bill for the making of the proposed line.

An Act to which the Royal assent was given on the 21st of July, 1873 (36 and 37 Vic., cap. 176),* empowered the Leeds, Castleford and Pontefract Junction Company to make a short line between two points on the North Eastern system—Garforth station and Castleford, with a branch to the Lancashire and Yorkshire Railway at Houghton. The object of the line was to open out a portion of the mineral district lying to the south of the Leeds and Selby branch. The length of railway sanctioned was $8\frac{1}{4}$ miles and the amount of capital authorised £120,000 in shares and £40,000 on loan. The line was obviously one in which the North Eastern Company were bound to have a predominant interest, and they arranged to subscribe not less than three-fourths of the capital. A similar independent connecting line in North Yorkshire—the Cleveland Extension Mineral Railway—which had been before Parliament in 1872, was also sanctioned this session, but owing to want of capital was never made. The Whitby, Redcar and Middlesbrough Union Company obtained power to deviate from the course of their authorised line. Two of the measures introduced for lines in the Cleveland district—the Hartlepoons and Cleveland Junction and the Whitby and North Cleveland Junction Railways—were withdrawn. A private mineral branch made by Mr. J. T. Wharton—the Kiltonthorpe Railway (1 mile), soon to come into the hands of the North Eastern Company—was opened on the 11th of June, 1873.

The year 1873 was marked by another addition to the comfort of travelling on the North Eastern Railway in the shape of sleeping carriages, which ran for the first time on the East Coast route on the 1st of September, 1873, attached to the down Scotch express leaving King's Cross at 8.30 p.m. and to the up express train leaving Glasgow at 9 p.m. and Edinburgh at 10.30 p.m.

The working expenses for the second half of 1873 showed a much smaller percentage of increase than did those of the first half— $15\frac{1}{2}$ against $22\frac{1}{2}$ per cent.—and the directors were able for the second time to recommend a dividend at the rate of 10 per cent. The years 1871-2-3 may be regarded as the summit-level of North Eastern prosperity; the dividends paid for those years were the highest ever earned by the Company.

* Directors appointed by the Act: Thomas Davison Bland, Thomas Bower, Edgar Breffitt, Thomas Mark Carter, William Locke, James Lowther, M.P., John Warrington. First Chairman: Thomas Davison Bland.

At this propitious moment the opportunity presented itself of acquiring the only remaining independent system in the district between the Tweed and the Humber—the little Blyth and Tyne Railway, which comprised $43\frac{3}{4}$ miles of line with coal-shipping staiths at Blyth and Howdon. The story of the rise of the Blyth and Tyne Railway from the status of a small waggonway to a compact little system of lines carrying upwards of a million passengers and competing successfully with the North Eastern Company for the Tynemouth, North Shields and Morpeth traffic, borders upon romance. In 1853 the passenger traffic yielded £4,600 and the goods and mineral traffic £13,200; in 1873, the passenger traffic yielded £53,574 and the goods and mineral traffic £129,234. Though heavily burdened with wayleaves, the railway had invariably paid good dividends. Another remarkable fact about the railway was that it had not sacrificed the life of a single passenger and scarcely broken a bone. One person, it is reported, did bring a claim for personal injury against the Company. He was taken into court on a stretcher and got a verdict, but he was seen walking about next day.* Having paid very high dividends— $12\frac{1}{2}$ per cent. in 1872 and 10 per cent. in 1873—the Blyth and Tyne directors stood out for a good price. Towards the end of January, 1874, terms of amalgamation were settled, the North Eastern Company agreeing to guarantee a dividend of 10 per cent. on the ordinary stock (£315,000), to pay the preferential charges and to hand over for distribution among the ordinary shareholders the sum of £50,000 in cash, on being placed in possession of all reserve funds and surplus property in addition to the railway and its shipping staiths. It was proposed to convert both the ordinary and preferential stocks of the Blyth and Tyne Company into North Eastern preferential stock bearing 4 per cent. interest, holders of the ordinary and 10 per cent. preferential stock receiving £250, and holders of the 5 per cent. preferential stock receiving £125 for each £100 share held by them.

The half yearly report which communicated the details of this arrangement to the North Eastern shareholders was the last to bear the signature of Mr. H. S. Thompson as chairman. Succeeding Mr. Hudson as chairman of the York and North Midland Company, Mr. Thompson had presided over the Board of that Company for five years. Appointed chairman of the North Eastern Railway Company in 1855, he had guided the deliberations of the directors at the most critical period of that Company's history, the policy so successfully pursued during these eventful years being largely laid down by

* Chairman's speech, Feb. 13th, 1874. *Newcastle Daily Journal*, Feb. 14th, 1874.

To face page 666.

PLATE XXXV.



Louise Dickinson, pinxt.

George Leeman—Chairman, 1874-1880.

himself. To his administrative skill and tact it would be difficult to pay too high a tribute of praise. He was "a man of ability," said Mr. Leeman, his successor, "unequalled in the chair of any other railway company in the Kingdom." Having assisted in the making of nearly every arrangement for amalgamation with the North Eastern Company since the very formation of the Company, Mr. Thompson, in resigning his position as chairman, must have felt no little satisfaction in knowing that the last of the old companies which remained outside the North Eastern system was about to be incorporated with it. As a mark of their appreciation and esteem, the shareholders, on the 13th of February, 1874, voted the sum of £2,500 to be applied by the directors in the purchase of a service of plate for presentation to Mr. Thompson, who, shortly afterwards, received the honour of a baronetcy. Owing, however, to his death on the 17th of May, 1874, the presentation was made to his eldest son, Sir Henry Meysey Meysey-Thompson, now Lord Knaresborough.

Early in 1874 the North Eastern Company had trouble again with a section of their servants. The trimmers and teemers of Tyne Dock asked to cease work on Saturdays at 4 o'clock in the afternoon instead of at midnight, and to resume work on Monday mornings at 6 o'clock instead of 3 o'clock. A change of this kind could not be made without inconvenience to the coal-owners and their customers; for, the detention of steamers in the dock meant an interruption in the regular supply of fuel to the London gas-works and delay in the return of waggons to the collieries. The directors could not agree to this interference with the trade of the port and the men came out on strike on the 2nd of February. To the local managers Mr. Tennant despatched the laconic message, "We must fight," and they prepared at once for the struggle. A number of men arrived at the dock the following day from Darlington to take the places of men out on strike, and by the end of the month only a few vacancies remained.

Labour troubles were unfortunately not confined to the North Eastern Railway. Owing to the downward movement of prices, which commenced in the latter part of 1873 and continued during the first three months of 1874, it became necessary to reduce wages in the two principal industries of the North of England. A reduction of 10 per cent. was made in the wages of the blast-furnacemen in March and in those of the Durham miners in April. The latter reduction was followed by a strike of about a week's duration, ostensibly arising out of the question whether the Durham pits should work 10 or 11 days per fortnight. In

Cleveland the enforcement of a reduction of $11\frac{1}{2}$ per cent. in the wages of the ironstone miners brought about a struggle of seven weeks' duration in May and June—the first really general organised strike of ironstone miners in the whole history of Cleveland. In the end the miners agreed to accept the terms against which they had offered such a determined resistance.* The strike caused a very serious falling off in the production of pig-iron for the months of May and June, many furnaces having had to be blown out for want of raw material. The effect of the strike on the revenue of the North Eastern Railway was shown by a decrease of £27,090 in the receipts from mineral traffic during the half year. There was a small increase of 3 per cent. on the whole of the gross receipts, but as the working expenses had increased by 11 per cent. the net revenue did not yield a higher dividend than $7\frac{1}{4}$ per cent.

In promoting the Bill for the construction of the Swinton and Knottingley joint line, the North Eastern and Midland Companies encountered opposition from the Manchester, Sheffield and Lincolnshire and Great Northern Companies, who brought forward a rival scheme—the Leeds, Pontefract and Sheffield Junction line—to cover nearly the same ground. These companies professed to be desirous of making a line that should be an open route or highway to everybody who was inclined to use it upon fair terms. It was retorted on behalf of the North Eastern and Midland Companies that the route which connected their systems was entirely in their own hands. They met at Normanton with nobody between them—with no partner to the north, with no partner to the south—and they had absolute control of the traffic. What the promoters of the rival line asked was really this: that the Midland and North Eastern Companies should not be allowed to confer a great public benefit by shortening the line and improving the service between Sheffield and the north, unless they let in two other companies. The preamble of neither Bill was declared proved, but arrangements were subsequently made which led to the re-committal of the Midland and North Eastern Companies' Bill. Running powers in favour of the Manchester Sheffield and Lincolnshire and Great Northern Companies were inserted, and the Bill, as altered, passed.

The North Eastern Company, who had opened the second section of the Ryedale Railway, from Helmsley to Kirbymoorside ($5\frac{1}{4}$ miles), on the 1st of January, 1874, and were proceeding with the third section

* *The Engineer*, December 25th, 1874.

between Kirbymoorside and Pickering, obtained powers this session to continue the line from Pickering to Seamer, a further distance of $16\frac{1}{2}$ miles. They were also empowered to make a short branch to the York Cattle Market and a tunnel under the river Tees east of Middlesbrough, with lines in connection with it, about 5 miles in length; to increase their interest in the Hull Docks by a further subscription of £50,000; to subscribe £90,000 to the capital of the Leeds, Castleford and Pontefract Junction Company, to purchase the Kiltonthorpe Railway; and, in conjunction with the London and North Western Company, to enlarge the Leeds New Station and make a new approach to it. An application for power to make a short residential line from Hull to Kirkella was rejected in consequence of the opposition of the Hull Corporation, who appear to have thought that the object of the line was to block the only remaining access to Hull for an independent railway passing through the Wolds. On the 7th of August, 1874, the Act legalising the arrangement with the Blyth and Tyne Company, and vesting their line in the North Eastern Railway system, received the Royal assent. This accession increased the length of lines worked by the North Eastern Railway to 1,378 miles. Another mile was soon afterwards added to the system by the purchase of the Kiltonthorpe Railway. Soon after the acquisition of the Blyth and Tyne Railway, the North Eastern Company received an offer from the Whitby, Redcar and Middlesbrough Union Railway Company, who, with a line half completed on their hands, found themselves at the end of their resources. Their works, which represented an expenditure of £240,000, had been suspended and the horses employed in the construction of the railway sold. By an Act passed this session they were authorised to raise £100,000 of additional capital and to borrow a further sum of £33,000, but no one would take their shares or advance money on works of so costly a nature. In this predicament they asked the North Eastern Company to take over the line and finish it. The North Eastern Board agreed to lease the line in perpetuity at a minimum rental of £4,500 per annum, with the option of acquiring the line after it had been open 10 years upon the net receipts at $22\frac{1}{2}$ years' purchase. They were to have 50 per cent. of the gross receipts for working the line and $4\frac{1}{2}$ per cent. on the capital raised to complete it. The portion of the line between Sandsend and Goldsborough had been constructed almost on the edge of the cliffs, and to obtain greater safety and security the North Eastern engineer proposed to divert the line between these points, carrying it further inland.

increased the water area of the dock from about 6 to about 12 acres, built a new entrance, 58 feet wide, giving 23 feet at high water spring tides and 15 feet at neaps, and constructed quays of a total length of 1,626 feet besides multiplying the appliances for the discharging of iron-ore and the shipment of pig-iron. As a further indication of the growing importance of Middlesbrough, it may be noted that on the 15th of November, 1874, a new excursion station was opened and brought into use for the general passenger traffic as a preliminary step to the building of one of the largest and finest stations on the North Eastern system. Contracts had been let for the works of the Monkwearmouth Junction and Castle Eden and Stockton lines, the main object of which was to improve the communication with Middlesbrough.

Besides extending the block system to the Hull and Doncaster branch* and other lines, and re-laying 62 miles of road with steel rails against 18 miles in 1873,† the North Eastern Company began in 1874 a series of experiments with a view to the ultimate general adoption of the Westinghouse air-brake upon their trains. Hitherto, they had only employed the ordinary hand brake except upon a few trains running on the Leeds and Pateley Bridge, the Sunderland and Hartlepool, and Ferryhill and Hartlepool lines, which were equipped with Newall and Fay's continuous brake.‡ They had three trains fitted with the Westinghouse air-brake—one for the Tynemouth, another for the Sunderland, and a third for the Consett branch. On the 18th of March, 1874, the Westinghouse air-brake was tested on the North Eastern Railway for the first time between Newcastle and Berwick, the train selected being that for working the Newcastle and Tynemouth branch. The train consisted of engine and tender, weighing 45 tons, and 9 vehicles, including 2 vans, weighing on an average about 6 tons each. There were 35 passengers in the train, one of whom was Mr. Westinghouse, the inventor, which brought the gross weight up to 101 tons.§ Stoppages were made at Cramlington, Plessey, Morpeth, Longhoughton, and Christon Bank. At the latter place, on a gradient of 150—the steepest between Newcastle and Berwick—the train, going at a speed of 40 miles per hour, was stopped in 22 seconds within a distance of 300 yards. On the return journey, at Longhoughton, on a gradient of 1 in 170, at a

* *Darlington and Stockton Times*, November 28th, 1874.

† Chairman's speech, half-yearly meeting, February 12th, 1875.

‡ *The Engineer*, March 20th, 1874.

§ *Engineering*, March 20th, 1874.

speed of 50 miles per hour, the train was pulled up in 20 seconds within a distance of 260 yards.*

The sensational event of the year, in railway circles generally, was the announcement by the Midland Railway Company, that, on the 1st of January, 1875, they intended to abolish second class carriages, to reduce the fares for first class to $1\frac{1}{2}$ d. per mile, and discontinue the use of all return tickets at reduced fares. This was an old idea revived, the Aberdeen Company, whose identity is now sunk in that of the Caledonian Company, having tried the experiment of two classes instead of three as early as 1855 for similar reasons to those advanced by the Midland Company.†

Diminished activity in the iron and coal trades accounted for a smaller rate of increase in the Company's revenue for the second half of 1874. Though a reduction to the extent of £72,936 had taken place in the case of coal and coke used by the Company during this period, the working expenses still showed an increase, mostly due to wages. The dividend paid was $\frac{3}{4}$ per cent. less than in the corresponding period, the average dividend for the whole year being $8\frac{1}{4}$ per cent. as against $9\frac{1}{4}$ for 1873.

Owing to the depression prevailing in the staple trades of the district the North Eastern Company were strongly urged to revert to the rates charged previous to the advance of October, 1872, and the North of England Freighters' Association opened a campaign at the beginning of the year against the North Eastern Company. What the freighters proposed to do was to construct, if the public would provide funds for the purpose, "a new system of railway communication, extending from the iron mines of Cleveland on the one side, past Middlesbrough and Stockton to the colliery districts," under the title of the "Yorkshire and Durham Railway."‡ Neither the Hartlepool nor the Darlington Chamber of Commerce had any illusions with regard to the sudden interest taken by the freighters in the district, and neither gave much support to the scheme.§

For some months the North Eastern directors had observed with great anxiety the depressed state of the iron trade, and finding how great was the pressure which had taken place in that important branch of industry, they

* The Westinghouse air-brake was not, however, the brake eventually adopted. See p. 681.

† "The Aberdeen Railway Company is just now trying an experiment worthy of notice. Instead of first, second and third class carriages, they are now running first and third only, so doing away with the second class altogether; and they now carry passengers in the first class at what were formerly second-class fares. The object is economy—by reducing the number of carriages running in our trains which will effect an important saving in wear and tear and the cost of rolling stock." *Durham and Sunderland Times*, October 13th, 1855.

‡ *Ibid.*, March 13th, 1875.

§ *Ibid.*, February 13th and March 20th, 1875.

decided to afford the manufacturers some relief in the form of an abatement of $7\frac{1}{2}$ per cent. in the charges for the carriage of materials used in the manufacture of iron—coal, coke, ironstone and limestone—a drawback allowed from the 1st of July, 1875.

During the course of 1875 the North Eastern system was increased by the following lines—the Kirbymoorside and Pickering ($6\frac{1}{2}$ miles) and the Knaresborough and Boroughbridge ($7\frac{1}{4}$ miles) opened on the 1st of April, and the Melmerby and Masham ($7\frac{1}{2}$ miles) opened on the 9th of June. Passenger stations were opened at Brotton, Carlin How, and Loftus on the 1st of April, passenger trains beginning to run between Saltburn and Loftus on that date. Soon afterwards, under a lease confirmed by Act of 19th of July, 1875, the Company obtained possession of the unfinished works of the Whitby, Redcar, and Middlesbrough Union Railway, which connected Loftus with Whitby. A portion of the Scotswood, Newburn and Wylam Railway—between Scotswood and Newburn ($2\frac{3}{4}$ miles) was opened for traffic on the 12th of July, arrangements having been made with the North Eastern Company for the working of the line. The opening of the Midland Company's line from Settle to Carlisle for goods traffic on the 1st of August, 1875, was an intimation to the East Coast Companies that a new competitive route to Scotland was nearing completion.

In their report to the 43rd half yearly general meeting, the North Eastern directors reminded the shareholders that the 50th anniversary of the Stockton and Darlington Railway was approaching, and stated that a committee had been appointed to make arrangements for commemorating so notable an event. After such a wonderful half century of progress they felt that here was presented a suitable occasion for the public recognition of the services rendered to the world by the pioneers of railway enterprise. As the oldest link in a great system comprising 1,400 miles of line and representing a capital expenditure of over fifty millions, the Stockton and Darlington Railway enjoyed no little local renown, but it had the unique distinction of being the starting point of the vast network of lines which covered a considerable portion of the habitable globe. It was really the Jubilee of the Railway which the North Eastern directors proposed to celebrate, and they resolved that the festival should not fail either in dignity or interest. The sum of £5,000 was placed at the disposal of the local committee for the purposes of the celebration. Darlington was properly chosen as the place in which the Jubilee festival should be held, and the Corporation of that town, impressed with a sense of the importance of the occasion, voted the sum of £1,000 towards the



From "The Illustrated London News," Oct. 9, 1875 p. 364.

RAILWAY JUBILEE AT DARLINGTON: THE PROCESSION.

cost of decorations and illuminations. It was decided that the celebration should extend over two days, the 27th and 28th of September, 1875, and that the programme of proceedings should embrace the following items:—(1) An exhibition of locomotive engines illustrative of the progress made in that branch of engineering from the year 1825; (2) the unveiling of the statue of Joseph Pease, the most representative figure in the history of the Stockton and Darlington Railway; (3) the presentation to the Corporation of Darlington of a portrait of Joseph Pease; (4) a great banquet to which the representatives of all the principal railways of the world should be invited; (5) excursions to places of industrial and general interest on or near the Stockton and Darlington Railway. The original suggestion to celebrate the jubilee of the railway had been made by Mr. Henry Pease, the Vice-chairman of the North Eastern Board. It was under his superintendence, as chairman of the local committee, that the arrangements for the festival were carried out.

The proceedings of the 27th of September began with a procession to escort the guests of the North Eastern Railway Company to the exhibition of engines in the North Road shops, and to accompany the Lord Mayor of London from the Bank Top station to the Pease statue. The thoroughfares along which it passed were profusely decorated; and the long lines of venetian masts, the many coloured banners and streamers, the triumphal arches, the festoons and garlands, the shields and scrolls bearing well known railway names, inscriptions and devices, made a singularly effective display. The statue of Joseph Pease by Mr. G. A. Lawson was duly unveiled by the Duke of Cleveland, the portrait by James Macbeth presented, and the great banquet held in the cricket field at the Feethams, then illuminations and fireworks on a grand scale closed the day's proceedings.

On the 28th of September the exhibition of engines was again open, and there were excursions to Stockton, Middlesbrough and Eston, to Redcar and Marske and to the beautiful little watering place of Saltburn, which, like the town of Middlesbrough, was a creation of the Stockton and Darlington Railway Company. The unique feature of the celebration was the exhibition of engines. No other railway in the world could have brought together so many interesting links in the history of steam locomotion. At one end of the series was "Locomotion" (1825); at the other No. 910 (1874) the heaviest and fastest of all the engines which took part in the brake trials at Newark three months earlier in the year, No. 1270 the latest of the "Ginx's Babies" (1874) and the great 8 feet "single" engine of the Great Northern Company. For ten years at least it was possible to follow the course of locomotive

development by means of such examples as the "Auckland" (No. 10) 1839, the "Dart" (No. 1041) 1840, the "Meteor" (No. 1050) 1843, the "Shildon" (No. 1033) 1846, the "Huddersfield" (No. 1089) 1846, the "Commerce" (No. 1035) 1847, the "Priam" (No. 1066) 1847, and an early tank engine (No. 273) 1850.

During the two days of the Jubilee a practical illustration was given in the yard of the North Road Works of the way in which the horses used to ride down portions of the Stockton and Darlington Railway—a large horse having been trained to jump into a dandy-cart attached to three or four waggons. The significance of the jubilee celebration consisted in the fact that it set up a landmark of national progress. Mr. T. E. Harrison, who had followed the course of locomotive development for fifty years, speaking at the great banquet, expressed the opinion that "we were still comparatively near our infancy as regards railways," and that the people living in 1925 would look back to the railways of 1875 with as much curiosity as those taking part in the jubilee celebration did to the railways of 1825. At present it may be doubted whether the prediction will be realised.

The Railway Jubilee was a pleasant interlude in the strenuous career of a great company. From the contemplation of the splendid achievements of the past, however, it was necessary to turn and confront the problems of the present which were ever increasing in gravity. Up to this time the rate of dividend paid by the Company had not been seriously affected by the depressed condition of the iron and coal trades. But the depression was spreading and the commercial outlook gave cause for alarm. The first step taken by the North Eastern Board to relieve the pressure on their shrinking revenue was to obtain the assent of the shareholders to a large financial operation, which would effect, both immediately and ultimately, a considerable saving in interest. This was the redemption of certain preferential stocks amounting to the large sum of £6,512,000 by the issue of a similar quantity of new stock entitled to a preferential dividend at the rate of $4\frac{1}{2}$ per cent. per annum until the 31st of December, 1882, and afterwards at the rate of 4 per cent. per annum in perpetuity.

Twelve miles of railway were added to the North Eastern system on the 1st of May, 1876, by the opening of the Leeds and Wetherby branch, which had been in course of construction about four years. The engineering features of the line comprised a heavy cutting at Scarcroft, 64 feet in depth, through beds of fire-clay, freestone, etc.: a skew-bridge near Bardsey station,

crossing the Leeds and Tadcaster turnpike road at an angle of 22 degrees, with a span of 120 feet; and a wrought-iron girder bridge of two spans over the river Wharfe, each span 90 feet in width. On the 13th of May, a second portion of the Scotswood, Newburn and Wylam Railway—from Newburn to Wylam (3 miles)—was opened for traffic as a single line. The Hylton, Southwick and Monkwearmouth Railway had been partially used for the conveyance of goods and minerals, and on the 1st of July, it was opened for traffic under a working arrangement with the North Eastern Railway Company.

By the opening of the Settle and Carlisle line for passenger traffic on the 1st of May, 1876, the long-threatened competition of a third route to Scotland became an accomplished fact. The Great Northern and North Eastern Companies resolved to accelerate the East Coast service, and on the 1st of July the 10 a.m. down express from London and the 10 a.m. up express from Edinburgh (1st and 2nd class) were timed to perform the journey in nine hours instead of nine hours and a half, the average speed being 44 miles an hour or, deducting the stoppages, 47·3 miles. What the two East Coast Companies accomplished in 9 hours the West Coast Companies performed in 10 hours and 25 minutes, and the Midland Company in 10 hours and 45 minutes, though these times were afterwards reduced respectively to 10 hours 20 minutes and 10 hours 33 minutes. The “Flying Scotsman” still retained its position as the fastest train in the world. The train leaving London soon after the “Flying Scotsman” with accommodation for third-class passengers was timed to run in $10\frac{1}{4}$ hours instead of $10\frac{1}{2}$ hours, and the night mail in $9\frac{1}{2}$ hours instead of $9\frac{3}{4}$ hours. By virtue of powers obtained in 1866 the East Coast Companies compelled the Caledonian Company to improve the service beyond Edinburgh, so that passengers leaving London at 8·30 p.m. by the night mail, reached Perth at 8·40 a.m.—20 minutes before the “Special Scotch Mail” of the West Coast Companies—and Aberdeen at 12·40 p.m., neck by neck with the rival train.

So far the changes introduced by the Midland Company in 1875 [see p. 672] had been chiefly felt by the North Eastern Company in the diminution of the amount received from second-class passengers, due to the fact that passengers travelling from the North Eastern to the Midland system, knowing they could not ride second-class after passing Normanton, took third-class tickets at the commencement of their journey. Now as a result of the Midland action the North Eastern Company and their partners had to submit to a reduction of their first-class fares between London and Edinburgh from £3 10s. to £2 17s. 6d.

By Act of July 13th, 1876, the Hexham and Allendale Railway became vested in the North Eastern Company on payment of £6 each for every fully-paid £10 share. The powers of the Leeds, Castleford and Pontefract Junction Company were also transferred to the North Eastern Company by the same Act, the shareholders of the Junction Company receiving £75 of North Eastern consols in exchange for every £100 of ordinary stock. During the second half of 1876 the Scotswood, Newburn and Wylam Company completed their railway, opening a second line of rails between Newburn and Wylam



Photo by

BRIDGE OVER THE TYNE AT WEST WYLAM.

H. Piper.

on the 24th of August, and the remaining portion of the line ($\frac{3}{4}$ mile) between Wylam and "The Hagg," on the south bank of the Tyne, in October. The beautiful little wrought-iron bridge which, with a single span of 240 feet, carried the railway over the Tyne at West Wylam, was officially inspected on the 6th of October. Designed by Mr. William George Laws, who adapted to railway purposes the principle embodied in Mr. Leather's famous bridge over the Aire at Leeds—that of the arched rib and the suspended roadway—it presented the appearance of lightness and grace rather than strength, but nevertheless came satisfactorily out of the unusually severe tests to which it was subjected. The cost of the bridge was £16,000.

For five years the works of the Leyburn and Hawes branch had been steadily progressing through Wensleydale towards the Midland Railway in the hands of Messrs. Gibb & Son (the builders of the Victoria bridge over the Wear in 1838), and on the 1st of February, 1877, the line was opened as far as Askrigg (13 miles). On the 1st of May a portion of the Castle Eden and Stockton branch between Carlton West Cabin and Bowesfield Junction was brought into use for mineral traffic, and on the 28th of May, the new connecting-line between East and West Hartlepool, running outside the dock area, was opened for passenger traffic, a curve to the west near Old Hartlepool affording facilities for West Hartlepool traffic to the north.

Since 1874 the North Eastern Company had been steadily experimenting with various types of continuous brakes—with the Heberlein brake between Newcastle and Tynemouth, with Smith's vacuum brake between York and Starbeck, with the Westinghouse air brake between Newcastle, Consett and Durham, and with the Westinghouse automatic brake, also between these points and between Newcastle and Carlisle, and Newcastle and Berwick. Of special interest was the series of trials which took place between Newcastle and Tweedmouth, on the 18th of March, 1877, with the Westinghouse automatic brake. The train used on this occasion consisted of 12 carriages, to every one of which two brake blocks were fitted, and an experimental van containing a speed indicator. The results far exceeded anything that had been reached before. At a speed of 50 miles an hour the train was brought to a state of rest in 203 yards on a down gradient of 1 in 754; at a speed of $60\frac{1}{2}$ miles an hour in 295 yards on a down gradient of 1 in 286; and at a speed of 64 miles an hour in 431·3 yards on the level.* These trials, coupled with what they had seen of the practical working of the brake on the Consett branch—a line with heavy gradients of 1 in 60 and 1 in 66—confirmed the North Eastern authorities in their opinion that the Westinghouse brake system was by far the best which had been introduced to their notice. A week later—on the 25th of March, 1877—a fatal accident occurred near Morpeth station, in which five persons were killed and several injured,† and it was

* *Engineering*, May 25th, 1877.

† The accident was due to the loosening of a fish-plate on a curve. At the pressure of the wheels of the engine drawing the night express from Edinburgh, the weakened joint gave way and the engine (No. 901) left the rails, and, with some carriages which became separated from the rest of the train, crossed to the "down" line, tearing up the rails and sleepers as it proceeded, and, after running 84 yards, fell over on its side near the rails of the Wansbeck Valley line. The hinder portion of the train following by the momentum acquired in travelling at a speed of 25 miles an hour, then plunged into the overturned carriages and tender, doing immense damage.



INTERIOR OF YORK STATION.

pointed out by Captain Tyler of the Board of Trade in a paper read before the Society of Arts, that had the train been provided with a continuous brake, its momentum could have been checked in six seconds after the engine left the rails, and the destruction caused by the hinder carriages rushing upon the tender and leading carriages would have been avoided.* The Board of Trade insisted upon the speedy application of an efficient continuous brake to the express trains. The Great Northern authorities preferred Smith's vacuum brake, and had already fitted up 50 or 60 of their engines with the vacuum apparatus. Taking this fact into consideration, the North British and North Eastern directors, though firmly convinced of the superiority of the Westinghouse brake, agreed to a proposal of the Great Northern Board that the two principal express trains, both up and down, between London and Edinburgh, should be furnished with the vacuum brake; and at 10 a.m. on the 25th of June, 1877, the first East Coast train furnished with this brake left London for Edinburgh, having 2 guards' vans, 4 composite and 4 first-class carriages, 1 saloon carriage and 1 royal mail van, behind the engine. It was arranged that the Westinghouse brake should be applied to the fast trains not affected to any great extent by the interchange of carriages with other companies.

Another event which marked this day—the 25th of June—was the opening of the new station at York and the loop line in connection with it between Severus and Holgate junctions. The new station—the largest in the United Kingdom—was built from the designs of Mr. Thomas Prosser, modified by Mr. Benjamin Burley and Mr. William Peachey. The picturesquely curved roof, supported on cast-iron columns and longitudinal wrought-iron girders with ribs of the same material, consisted of four semi-circular spans, the largest, 81 feet in width, covering the four lines of rails reserved for the main through traffic. The length of the roofed portion of the station was 800 feet, the width 234 feet, and the height from the platform level to the underside of the girders of the main span 42 feet. The full length of the main platform was 1,500 feet, the approach being through a handsome booking-hall on the east side to which a portico of brick with stone dressings, fronting the city walls, gave access. Little did the shareholder who described the station as “a very splendid monument of extravagance” dream that, in a comparatively few years, it would have to be enlarged to meet the requirements of increasing traffic.

On the 1st of November, 1877, the Dearness Valley line which had been used since 1858 for mineral traffic was opened for passenger traffic. The

* *The Engineer*, May 4th, 1877.

short junction lines near Durham (Baxter Wood connections), 1 mile, were also opened this month. On the 1st of December, 1877, the large fine station at Middlesbrough, which had been for some years in course of construction, was opened for traffic. Built from the designs of Mr. William Peachey, it was an architectural tribute to the greatness of Middlesbrough. The chief entrance was by a carriage drive from the corner of Zetland and Linthorpe roads. The main platforms extended to a length of 600 feet and were covered by a roof composed of wrought-iron lattice girders, 60 feet in



MIDDLESBROUGH STATION.

height from the level of the rails to the apex of the roof. On the 20th of May, 1878, the new station works at York were completed by the opening of a large hotel, built of brick with stone quoins and cornices, standing, five storeys high, on a slight elevation overlooking the Ouse in grounds laid out as pleasure gardens which extended to the banks of the river.

The following lines were also opened in 1878, viz. :—A part of the Leeds, Castleford and Pontefract Junction Railway, from Garforth to Castleford ($6\frac{1}{2}$ miles), on which goods and mineral trains had previously been working, on the 12th of August for passenger traffic; the last section of the Wensley-

dale railway, from Askrigg to Hawes ($4\frac{1}{4}$ miles), for goods and minerals on the 1st of June and for passengers on the 1st of October; the Hawes Joint Line ($\frac{1}{4}$ mile)—a link between the Wensleydale railway and the Midland system, on the 1st of October; the Tweedmouth Dock branch, a short line between the Tweedmouth Goods Yard and a small dock, which had been constructed two years earlier, on the 16th of October. The works of the Leeds joint station extension were sufficiently advanced this year to admit of the new part of the station being brought into partial use. They included a new approach from Boar Lane in a straight line with Albion Street, the addition of a third large span to the roof, the formation of a new through platform and the transformation of the old through platform into docks for the accommodation of local trains. The heavy goods traffic which formerly passed through the station was now carried outside the station by means of independent lines of rails. The new part of the station was brought into full use on the 5th of January, 1879.*

The various works commenced in the "spacious times" preceding the Jubilee could not be stopped without entailing a much greater outlay in the future. The policy of the directors, however, was to limit the work done to what was absolutely necessary, and to entertain no application for new lines, until the commercial circumstances of the country were much improved. As a consequence of this policy, the expenditure on capital account which, in 1874, 1875, and 1876, was two millions a year, dropped in 1877 to a million, in 1878 to three quarters of a million, and in 1879 to half a million. One item which, in 1875 alone represented an expenditure of three quarters of a million—that of working stock—entirely disappeared from the capital account in the second half of 1877, and no money was expended on this account for additional working stock until 1882. By the end of 1877 the installation of the block system was practically completed, and the work of interlocking the points and signals accomplished; consequently the outlay under these heads fell to a normal level.

With the year 1878 the progress of the great trade depression, accelerated by a coal miners' strike in Northumberland from the 18th of December, 1877, to the 14th of February, 1878, began to be felt more severely by the North Eastern Company, and there was a decrease of 5 per cent. in the gross receipts for the first half of the year. Fortunately, the reduced cost of fuel and the lower prices of rails and other materials affected the working expenses in an

* *The Engineer*, January 10th, 1879.

even greater degree, and the economy with which the traffic was worked, neutralised to some extent the falling off in the receipts.

Upon a small company like the Merrybent and Darlington—already embarrassed financially—the depression in the iron trade had a disastrous effect. The Darlington District Joint Stock Banking Company having obtained a judgment against them in February, 1878, for £18,322, it was decided that the affairs of the Company should be wound up, the Company dissolved, and their property sold under an order of the Court of Chancery for the benefit of the creditors. An Act for this purpose was obtained on the 17th of June, 1878, and the railway came into the hands of the Banking Company.

The North Eastern Company, it will be remembered, had made a rebate of $7\frac{1}{2}$ per cent. in July, 1875, in their charges on materials carried for iron-making purposes and now, to afford assistance to the ironmasters and enable them, if possible, to keep their furnaces in blast, a further rebate of $7\frac{1}{2}$ per cent. was granted from the 1st of November, 1878, to the 1st of April, 1879—afterwards extended to the end of the year—but the relief was too small to avert disaster from several of the more hardly-pressed firms. The Rosedale and Ferryhill Iron Company suspended payment in January, 1879, and Messrs. Hopkins, Gilkes & Co., Ltd., Messrs. Lloyd & Co., the Skerne Iron Co., Ltd., and other firms went under soon afterwards—the last of an alarming series of failures which began with the downfall of the great firm of Thomas Vaughan & Co. in 1876.

The coal-miners' strike in Northumberland was followed in 1879 by a coal-miners' strike in Durham, which, lasting from the 5th of April to the 19th of May, caused a further disturbance of trade in the North of England. This half-year the North Eastern Company touched the bottom of the great depression, but already as the shareholders were told "there seemed to be every now and then lights upon the horizon, and if these lights grew they would grow in the North Eastern district."* Not only were there signs of revival in America, but, to discerning minds, the successful application which had taken place at Middlesbrough, on the 4th of April, 1879, of the Thomas-Gilchrist process for the elimination of phosphorus from inferior iron in a Bessemer converter, augured well for the future of the Cleveland steel trade, and incidentally for the prospects of the North Eastern Railway Company.

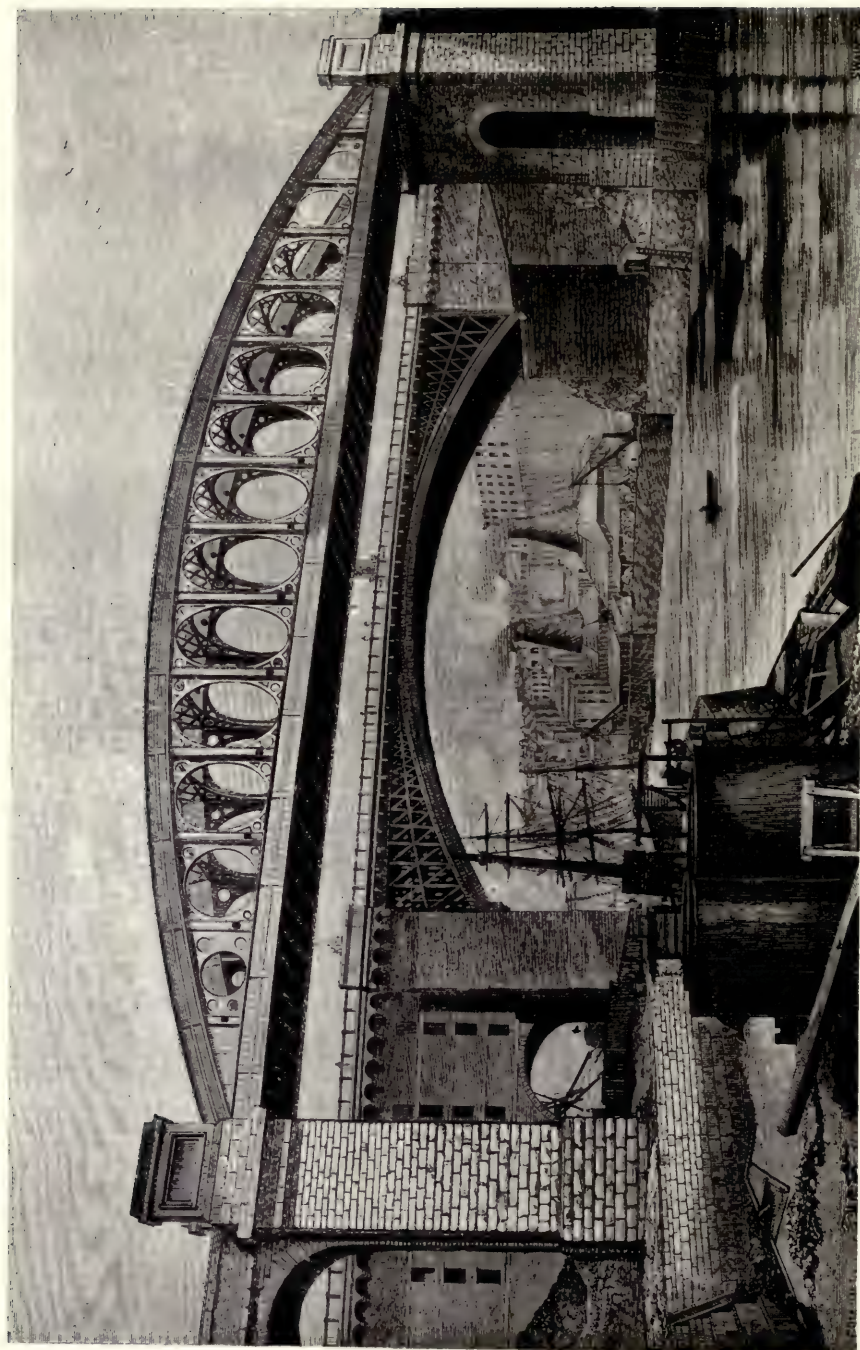
A number of new lines, which represented an enormous amount of unpro-

* Mr. J. W. Pease at half-yearly meeting. *Newcastle Daily Journal*, August 16th, 1879.

ductive capital, were now about to begin earning revenue. The first of these, opened for general traffic on the 1st of May, 1879, was the Byker, Walker and Percy Main line (Riverside Railway) which consisted for the most part of tunnels, bridges, cuttings, retaining-walls, and embankments—an exceptionally heavy series of works; the next was a loop line at South Shields from High Shields station to the old Stanhope and Tyne line in Milldam Vale ($\frac{3}{4}$ mile) opened on the 2nd of June, 1879, together with a new station in Mile End Road; a third, opened on the 19th of May, 1879, for goods, and on the 1st of July, 1879, for passengers, was the Swinton and Knottingley Joint Line, which shortened the journey between York and St. Pancras by about thirteen miles and improved the communication between the west and north of England; a fourth was a short branch at Hull ($1\frac{3}{4}$ miles) for the accommodation of the Manchester, Sheffield, and Lincolnshire Company, who, on the 1st of August, 1879, opened for traffic the new goods warehouse in Kingston Street, built for them by the North Eastern Company; a fifth, opened on the 4th of August, 1879, was the Monkwearmouth Junction Line which connected the old Brandling Junction and Durham and Sunderland Railways and enabled a direct service of trains to be run between Newcastle and the Hartlepoons.

The works of the Monkwearmouth Junction line comprised a bridge over the River Wear, a central station at Sunderland and two tunnels of an aggregate length of 1,000 yards. The bridge, designed by Mr. T. E. Harrison, consisted of a main span, 300 feet in width, at a height of 86 feet above high-water mark and three stone arches and piers on each side, and carried the railway over the river on transverse wrought-iron girders between two bowstring box girders stiffened with open webs. The new station was a very long and a very narrow one, lying for the most part in a deep cutting. The station buildings, surmounted by a clock-tower, fronted High Street, but the platforms were 16 feet below the level of the streets, covered to their whole length—about 200 yards—by a semi-elliptical iron roof 95 feet in span. From this time the Hendon and Fawcett Street stations were closed at Sunderland.

The accounts for the first half year of 1879 presented a discouraging picture of the state of trade in the district. Under every revenue head there were decreases; the largest, it is needless to say, under the head of minerals. A striking symptom of diminished vitality in the staple industries was the large decrease in the number of third-class passengers carried, viz., 513,867, which adversely affected the revenue to the extent of £26,085. Never had



From "The Engineer," Nov 12th, 1880, p. 563

BRIDGE OVER THE WEAR AT SUNDERLAND.

the North Eastern accounts recorded so great a falling-off in the third-class traffic. The dividend dropped from 6 to 5 per cent.—the lowest rate of dividend so far declared on North Eastern consols. One of the Company's stocks was still entitled, up to the 30th of June, 1879, to a dividend of 8 per cent.—the old Hartlepool capital stock—but from the 1st of July, 1879, this stock, amounting to £440,570 became, under the provisions of the Company's Acts, a part of the ordinary stock and received the same dividend as North Eastern consols.

In the latter part of 1879 the City of York obtained additional railway accommodation in the form of a short line from the Scarborough branch to the neighbourhood of Walmgate Bar for the conveyance of minerals and cattle, etc., to the south-east side of the city—the York Cattle Market or Foss Islands branch ($1\frac{3}{4}$ miles) which was opened for traffic on the 8th of December.

As the year drew to a close there was a slight lifting of the cloud which hung over the trade of the country, and a favourable change was noted in the condition of the leading industries of the North of England. It was hoped that the long tale of unhappy events which marked the progress of this year was closed. But not so. On the 28th of December a portion of the great bridge which carried the Dundee and Aberdeen traffic of the East Coast Companies over the estuary of the River Tay was blown down in a gale of extraordinary violence while a train was crossing it. The Morpeth accident, the Tay Bridge disaster, together with the protracted strikes, commercial failures and general stagnation in trade gave an almost fateful significance to the year 1879. The North Eastern Company, however, had seen the worst. There was a much smaller percentage of decrease in the gross receipts in the second than in the first half year, and there was a great reduction in the working expenses due almost entirely to the very low prices at which the Company had been able to purchase their steel rails. The net revenue yielded a dividend of $6\frac{3}{4}$ per cent. or $\frac{1}{4}$ per cent. less than in the corresponding period, the average dividend for the whole year being $5\frac{3}{8}$ per cent. Comparing the working results for 1879 with those for 1875 when the gross receipts rose to a point which they did not attain again until 1882, we realise what the great depression in trade meant to the North Eastern Railway. The total amount received by the Company in 1879 from all sources of traffic was less by a million pounds than that which flowed into their coffers in 1875, a decrease of 15·6 per cent. Of this decrease, 3·6 per cent. appeared under the head of passenger traffic, 5 per cent. under the head of goods traffic, and

mineral traffic accounted for the remaining 7 per cent. In 1875 the number of miles worked by the Company was 1,400. By the end of 1879 seventy-six other miles had been added to the system, and yet the passengers who travelled over the Company's lines in 1879 were fewer by two millions and a half than in 1875—fewer by one million first and second class passengers and one million and a half third class passengers. One further significant comparison may be made in conclusion, showing the beneficial effects of the appliances introduced by the Company for the safety of the travelling public. In 1875 the amount paid under the head of compensation for personal injury was £34,197 or 2·2 per cent. of the receipts from passenger traffic; in 1879 the amount was only £5,683 or ·44 per cent. of the receipts from passengers. The amount paid for damage to and loss of goods in 1875 was £22,277 or 1 per cent. of the receipts from merchandise traffic; in 1879 it was £9,196 or ·44 per cent. of the receipts from merchandise traffic.



SEAL OF BLYTH AND TYNE RAILWAY COMPANY.

To face page 688.

PLATE XXXVI.



Photo by

H. Walter Barnett.

Sir Edward Grey, M.P.—Chairman, 1904-1906.

CHAPTER XX.

TWENTY-FIVE YEARS OF PROGRESS.

[1880-1904].

The latter half of the fifty years' history of the Company, though not less full of incident and activity than the former, is sooner told. In the earlier period of its existence every step was an experiment, and every detail had its own significance in the formation of a great system; but experiment and innovation in time become routine, and the progress of later years is more easily measured by a general survey of some of the Company's principal concerns during a long period than by recording its numerous and varied achievements year by year.

The principal extensions of the Company's system during these twenty-five years may be conveniently grouped under the following heads:—

- (1) New lines, in many cases constructed in lieu of more ambitious proposals of independent promoters.
- (2) Purchase of lines owned by smaller Companies.
- (3) General improvements to cope with increasing requirements of trade.
- (4) The development of the Port of Hull, which in view of the complicated situation occasioned by a variety of rival interests deserves to be considered separately.

First, then, as to new lines.—In the early part of 1881 the attention of the Board had been directed to a somewhat neglected portion of their territory by the revival of a scheme for a “Central Northumberland Railway,” starting from Newcastle and running by way of Scotsgap, Rothbury, Whittingham and Wooler to Coldstream. While unfavourable to the project of a line from Newcastle to Coldstream, the directors thought that a practicable line might be made from Alnwick to Coldstream, but this did not meet the views of the promoters of the larger scheme, who declined to regard the Central Northumberland Railway as a mere agricultural line. They considered it rather

as a part of a new direct route between Newcastle and Edinburgh and on this account entitled to the support of the traders of Newcastle and Gateshead. In conjunction with the North British Company, who owned the line between Scots Gap and Rothbury which it was intended to utilise, they lodged a bill for the original scheme; the North Eastern at the same time applied for powers to construct a line between Alnwick and Coldstream, $35\frac{1}{2}$ miles in length, and succeeded in obtaining them in 1882. The line was opened between Coldstream and Wooperton for goods and mineral traffic on the 2nd of May, 1887, and throughout for all kinds of traffic on the 5th of September. With the exception of an immense embankment on Learmouth Bog and a deep cutting near Kilham, there was nothing of much engineering interest on the northern section of the line. On the southern section there was a remarkable cutting on Lemmington Bank on which the gradients were 1 in 50, a tunnel a mile and a half long to the south of Whittingham, and a new station at Alnwick. The "Central Northumberland Scheme" was abandoned.

Another district which had been frequently surveyed for railways was that lying between Upper Wharfedale and Wensleydale. Through this "no man's land," by way of Kettlewell, two parties of railway speculators in 1881 proposed to advance into the North Eastern district, one—the Skipton and Kettlewell Company—intending to penetrate as far as Darlington, the other—the North Yorkshire and Lancashire Company—laying their plans to stop short at Spennithorne, but having Darlington in view. In the south, too, North Eastern interests were threatened by the "East and West Yorkshire Union" scheme, intended to connect the Great Northern and Hull and Barnsley lines by means of a railway running from Ardsley by way of Woodlesford and Castleford to Drax. This was carried against them in the House of Commons, but they succeeded in getting it thrown out by the House of Lords. As to the Skipton and Darlington and Hellifield and Spennithorne schemes, one failed through non-compliance with the standing orders, the other was withdrawn as soon as the North Eastern put in an appearance. In the session of 1883, the Skipton and Kettlewell Railway Company again brought forward their scheme for an extension of their authorised line through the dales, not only to Darlington, but to Stockton and Middlesbrough. The North Eastern therefore promoted two lines which were designed to serve the district at least as well as the rival schemes—one running from Scorton to Spennithorne, the other from Darlington to Fighting Cocks. The necessary powers were obtained for making the

latter line which greatly improved the route to Middlesbrough but, owing to objections on the part of the landowners, the Scorton and Spennithorne Bill was withdrawn.

Another independent scheme was that of Sir George Elliot, one of the leading north-country coal-owners, who thought that the cost of transport from his collieries could be cheapened and dock dues saved by shipping in the Tyne at Dunston instead of at Tyne Dock. With this object in view, he brought forward in 1885 the "West Durham and Tyne Railway" scheme, supported by other large coal-owners in the Pontop and Tanfield districts. A few years earlier, such a scheme would have been impossible owing to the obstructions in the navigation of the river, but the Tyne Commissioners had removed shoals and sandbanks and replaced the old stone bridge at Newcastle by a hydraulic swing-bridge so that ships of 1,500 and 1,600 tons burden could get up to Elswick. The scheme consisted of a line from Pelton Fell, through Birtley, to coal-shipping staiths at Dunston with several short lines and junction curves, giving access to four of the North Eastern lines and to two of the colliery railways of the district. It was proposed to take running powers over the North Eastern lines from Pelton to Cold Rowley and from Lamesley to Tyne Dock and the Central Station, Newcastle.

No county, perhaps, had less reason to complain of insufficient facilities for its traffic than Durham. Hardly had the notices for the new line appeared than the North Eastern Company opened (on the 1st of December, 1885)—the branch between Bishop Auckland and Spennymoor which, besides uniting two populous districts, improved the communication between the Hartlepoons and West Durham. Soon after (on the 1st of January, 1886) they opened the Annfield Deviation line for goods and mineral traffic, which superseded the old Loud Bank inclines of the Stanhope and Tyne Railway, worked up to that time by a stationary engine. The junction line between Darlington and Fighting Cocks was nearly completed and the question of a railway extension to Upper Weardale was already being considered.

In their opposition to the West Durham and Tyne Bill, the North Eastern Company were at first unsuccessful. Though they showed that the shipping facilities at Tyne Dock were unrivalled, that the rates—reduced to a very low point in 1860 when the Company were paying only 4s. per ton for their coals—had never been disturbed even in the good times of 1873 when the price of coals rose to 16s. and 17s. per ton, the Committee of the House of Commons took the view that the coal-owners of the Pontop and

Tanfield districts were entitled to have the option of sending their coals to Dunston if they thought it would be to their advantage, and they passed the Bill. When the Bill reached the House of Lords, however, it was pointed out to the Committee that short connecting lines between the Pontop and South Shields and Team Valley branches and between the Team Valley and Redheugh branches would afford the same accommodation as the proposed railway and prevent a large waste of capital. On the understanding that the North Eastern would make the connections and erect staiths at Dunston, the Committee reversed the decision of the Commons and threw out the Bill. Owing to the series of inclined planes between Stanley and Stella Gill the western part of the old Pontop and South Shields branch could not be used for the conveyance of passengers, and the populous district of Annfield Plain was shut out from the benefit of railway accommodation. The Company therefore took advantage of the occasion to include a line from a point above the inclines to the neighbourhood of Ouston which would give the necessary facilities to the Annfield district.

In 1892 an attempt was made to revive the scheme for a railway from Hellfield to Darlington, but again the promoters failed in their purpose, the traders of South Durham and North Yorkshire showing no inclination to subscribe £1,750,000 for the mere gratification of driving another thorn into the side of the North Eastern. Close on the heels of this extensive and visionary project followed another of even bolder conception, for a railway from Manchester to Glasgow *via* Newcastle-upon-Tyne with a branch from the main line near Washington, across the Tyne at Hebburn, to the Albert Edward Dock, and another branch to Sunderland. It was proposed to cross the Tyne at Newcastle by another high-level bridge, touching the northern bank of the river at Pilgrim Street. The capital required was about ten millions. In Newcastle the scheme met with a favourable reception. The Mayor and many members of the City Council supported it, prominent members of the local Chamber of Commerce expressed approval of it, and representative meetings passed resolutions in favour of it; but the public generally withheld their support and the plans were never deposited. About the same time a Durham coast scheme for a new line between West Hartlepool and Seaham Harbour and running powers over the Londonderry railway to Sunderland docks obtained sufficient support to justify the promoters in applying for an Act. Owing, however, to the opposition of the North Eastern and the Marquis of Londonderry, their Bill was thrown out in the session of 1893 by a Committee of the House of Commons. A Bill

promoted by the Broomhill Coal Company for a short line between their colliery and Amble, and a Bill to enable the Scarborough, Bridlington and West Riding Company to make a competing line in the East Riding of Yorkshire shared the same fate, and the North Eastern Directors had the double satisfaction, in the failure of these various schemes, of having protected the interests of their shareholders and of having convinced Parliament that those of the public were safe enough in their hands without the introduction of competing companies.

After the rejection of their Bill, the promoters of the Durham coast scheme having altered the course of their proposed line, carrying it from West Hartlepool through Hart Warren, Castle Eden, Easington and Hawthorn to Dalton-le-Dale, with a branch to Sunderland, once more gave notice of their intention to apply for an Act, but they were obliged to abandon the design owing to "the apathy of the local authorities." The North Eastern Company thereupon undertook, themselves, to fill up this gap in their system as soon as there were prospects of coal pits being opened out along the route. A Bill to authorise the making of this line, received the royal assent on the 24th July, 1894.

The progress of the light railway movement in the agricultural districts of the North Eastern Railway during the latter years of the century had been closely watched by the Board. Under their direction the North Eastern Company purchased one railway—the Cawood, Wistow and Selby—and took upon themselves the obligation of making lines in substitution of light railways proposed from Gosforth to Ponteland and Selby to Goole; from 1900 they worked, and in 1902 acquired jointly with the Lancashire and Yorkshire Company, the Goole and Marshland and Isle of Axholme light railways which were open at that time for goods traffic as far as Fockerby and Crowle. The North Eastern Company had originally intended to acquire these lines independently, and to make an extension from Haxey to Dalton and Laughton, through an important coal-field about to be developed in South Yorkshire. But they had withdrawn the proposals from their Bill of 1901 owing to arrangements made with the Lancashire and Yorkshire which provided for the joint access of the two Companies to the new coal-field from Thorne and Shaftholme junction. Several other Companies projected lines into the same district. Among these were the Midland and Great Central Companies who sought power to acquire the Shireoaks, Laughton and Maltby Railway authorised in 1901, and to construct a line from Laughton to join the Great Central between Doncaster and Thorne.

Instead of fighting for the new district the promoters of the two competing joint lines agreed to combine and, in conjunction with the Great Northern, to promote a line from Dinnington to Kirk Sandall ($19\frac{1}{4}$ miles) which should be owned jointly by the five companies in equal shares. This arrangement received the approval of Parliament in the form of the South Yorkshire Joint Railway Act, 1903.

Secondly, with regard to the purchase of smaller undertakings. Since 1874 the Tees Valley Company had been trying to dispose of their line to the North Eastern, who already held £31,000 of the capital. After many futile negotiations, the North Eastern Company agreed in 1880 to take over the line, $7\frac{1}{2}$ miles in length, buying out the other shareholders for £25,188 and discharging a debt, amounting to about £22,000. These terms gave the ordinary shareholder, who had never received a higher dividend than $2\frac{1}{2}$ per cent., £19 7s. 6d. for each £25 share.

The Scotswood, Newburn and Wylam and the Hylton, Southwick and Monkwearmouth Companies soon followed the Tees Valley Company into the North Eastern fold. With both of them fate had dealt unkindly. Neither had paid a dividend on their ordinary stock and their liabilities were increasing. The Tyneside line ($6\frac{1}{2}$ miles in length) was acquired for £155,746; the Wearside line ($4\frac{1}{4}$ miles in length) for £130,000.

The next acquisition, in 1889, was that of the Whitby, Redcar and Middlesbrough Union Railway which had been leased, unfinished, to the North Eastern Company in 1875, completed and opened on the 3rd of December, 1883, and worked for five years as part of the North Eastern system. The net receipts from the line, so far from yielding a surplus for division between the owning and leasing companies, were not even sufficient to pay the minimum rental of £4,500 a year. The ironstone of the district between Whitby and Loftus still lay untouched in its native beds, and hopes based on a large mineral traffic could no longer be entertained. Seeing no way out of their difficulties the Whitby Company disposed of their interest in the line to the North Eastern for £25,000, the latter Company taking over their loans and liabilities. Up to 1875 the capital outlay on the line had been £350,000 and from 1875 to 1883 £300,000. Including nearly £38,000 paid out of revenue in the form of rent, the actual cost of the line was not far short of £700,000 or about £42,000 per mile. The line opened out one of the most lovely and romantic portions of the Yorkshire coast. Running nearly parallel with the sea-shore, across deep ravines and sometimes on the very edge of the cliff, it afforded at every point in its winding course of $16\frac{1}{2}$

miles glimpses of the sea in combination with hills and moors and wooded valleys. From the engineering point of view the line had many features of interest—deep cuttings and a tunnel near Easington, a high embankment through Twizegill between Easington and Hinderwell, tunnels near Kettle-ness, light iron viaducts of novel construction at Staithes, Sandsend, East Row, Newholm and Upgang. One of the tunnels between Kettle-ness and Sandsend was 1,651 yards in length with a gradient of 1 in 55½ falling



Photo by

STAITHES VIADUCT, NEAR WHITBY.

Payne Jennings.

towards Whitby. The most remarkable of the viaducts was that which carried the railway over the vale of Dale House, built from the designs of Mr. John Dixon, C.E. It was 700 feet in length and 152 feet in height above the bed of the beck, divided into seventeen spans, some of 60 feet and others of 30 feet. The piers, as completed in 1875, consisted, each, of two tubular columns of plate iron filled with cement and braced together at intervals, but, in 1883 the piers were all connected by means of longitudinal lattice bracing, which, though strengthening, altered the appearance of the viaduct.

The Scarborough and Whitby line (20½ miles) was opened on the 16th of July, 1885, thirteen years after the cutting of the first sod. Like the Whitby and Redcar line, it commanded a series of magnificent sea-views, passing through or near Scalby, Cloughton, Hayburn Wyke, Stainton Dale, Robin Hood's Bay and Hawkser. The river Esk was crossed near Whitby by a large red-brick viaduct of thirteen arches similar in design to that over the Skelton beck near Marske Mill. 915 feet in length and 120 feet in height from the bed of the river to the rail level, with arches varying in span from 55 to 65 feet, this viaduct formed a picturesque feature in the Whitby district. The line had been constructed according to the plans of Sir Charles Fox and Son, at a cost of about £27,000 per mile. An agreement with the North Eastern Company provided for the working of the line by the latter for 50 per cent. of the gross receipts, but after working it for some years to their pecuniary disadvantage, they came to the conclusion that the best course was to purchase it, and for £261,633 paid in stock, the North Eastern Company in 1898 acquired an undertaking upon which £649,813 had been expended.

Shortly before the opening of the Scarborough and Whitby line in 1885 a scheme had been put forward to make an extension of this railway from Scarborough, through Market Weighton and Driffield, to the Hull and Barnsley Railway near Howden, under the title of the "Scarborough and East Riding Railway." The promoters of the line received little support in Scarborough, and found difficulty in raising funds elsewhere owing to the depressed state of the money market. The North Eastern were willing to withdraw their opposition to the scheme provided it were limited to a line from Seamer Junction, through Driffield to Market Weighton, and they offered to work this line upon favourable terms. This offer was accepted, and a Bill to confirm the arrangement was introduced into Parliament. A section of the promoters, however, repudiated the action of their representatives in coming to terms with the North Eastern and petitioned against their own Bill; while the North Eastern, who originally opposed the Bill, instructed counsel to appear in support of it. The Bill did not pass in 1884, but the same line, under the title of the "Scarborough, Bridlington and West Riding Junction Railway," was sanctioned in 1885, and in 1890 was opened for traffic, creating a direct route to Bridlington and Filey from the West Riding of Yorkshire and the south.*

* In 1913 an agreement was come to whereby this railway, which had been worked by the N.E.R. Company from its opening, has been amalgamated with the N.E.R.

In 1890 the North Eastern purchased the little Merrybent and Darlington Railway, which was one of the assets of the Darlington District Bank reserved by the shareholders when they transferred their undertaking to the York City and County Bank in 1884.*

In 1892 a scheme for an extension, about $9\frac{1}{2}$ miles in length, of the Wear Valley Railway to Upper Weardale by an independent company received Parliamentary sanction,† but in 1894 the latter transferred their powers to the North Eastern who were originally authorised to subscribe £40,000 to their capital. On the 21st of October, 1895, the line was opened for all kinds of traffic, exactly two years after the cutting of the first sod. Commencing near the old Station at Stanhope and rising by gradients of 1 in 100, and, near St. John's Chapel, of 1 in 75 up to Wearhead, the railway in its course up the valley never diverges far from the river which it crosses three times, near Stanhope, Craig Nook, and Eastgate.

Under the third heading, that of improvements for the accommodation of traders in their own districts, a typical instance may be cited in the case of Blyth. From 1874 Blyth as a coal-shipping port had been gradually declining. Only vessels of a small size could enter the harbour, and these often lay aground before completing their cargoes. The larger vessels were obliged to go elsewhere. It was not until 1881 that the old Harbour Company began the work of deepening the channel and removing the silt from the loading berths. In 1882 a Board of Commissioners was formed with Sir Matthew White Ridley as chairman, to take over the management of the harbour and continue the work of improvement. During this year only 93 vessels visited the port, and the shipments of coal from both North and South Blyth were less than 157,000 tons. The staiths, at which horses were still employed to haul the waggons to and from the spouts, belonged to the early days of the old Blyth and Tyne Company. At an expense of £25,000, the North Eastern erected on the Low Quay a range of staiths, 1,100 feet in length, more than double the height of the old ones with four spouts arranged in pairs, $87\frac{1}{2}$ feet apart, and an inclined approach to standage-lines on the top from a nest of sidings for the reception of the loaded and empty waggons. The loaded waggons were pushed up the inclined approach by locomotives; the empty waggons ran back by gravitation. At these new staiths—which were brought into use on the 28th of

* *Banks, Bankers, and Banking in Northumberland, Durham and North Yorkshire*, by M. Phillips, 1894.

† Act 55 and 56, Vic. cap. 128.

February, 1884—two steamers, each 350 feet long, could be loaded at one time. In 1883 the shipments at South Blyth had fallen to 42,176 tons. In 1884, after the opening of the new staiths, they rose to 252,780 tons. By the end of 1885, a new west pier, 2,470 feet in length, was completed by the Commissioners. In 1886, Ashington Colliery obtained improved facilities for shipping at Blyth by means of a junction with the Blyth and Tyne line at Hirst (now Ashington) station. Previously the coals had had to go along the main line to Morpeth and thence by way of Bedlington and Newsham to Blyth. The shipments at South Blyth in 1886 were 429,961 tons and in 1887, notwithstanding a seventeen weeks' strike of the Northum-



COAL-SHIPPING STAITHS, SOUTH BLYTH.

berland miners, 466,983 tons. Owing to the demand for additional staith accommodation the North Eastern Company erected, on a jetty of greenheart piling to the eastward of the Low Quay, another range of staiths, 1,237 feet in length with four spouts, opened May 1st, 1888, constructing at the same time a loop line, a mile and a half in length, from Newsham to the southernmost end of the staiths, together with reception sidings at Blyth.

The new Blyth staiths and the loop line between Newsham and Blyth quay were the last of a long series of works constructed from the plans and under the direction of Mr. T. E. Harrison for the North Eastern Railway. But before the opening of the new staiths for public use the eminent engineer, who so long ago as 1834 had designed the Stanhope and Tyne staiths at South

Shields, was no more. He died in harness on the 20th of March, 1888. Since Mr. Harrison, in conjunction with Mr. Tennant and Mr. Sherriff, worked out the plan of amalgamation which brought into being the North Eastern Company, the Company had had the benefit not only of his great engineering skill, but of his practical knowledge and experience of railway work generally, Mr. Harrison's influence and authority extending, even to the last, much beyond the limits of his own department.

In one of the Bills promoted by the North Eastern Company in the session of 1893, powers were taken to construct coal-shipping staiths at North Blyth and to double and extend the Cambois branch line in connection with the staiths. At South Blyth the Company were shipping coals at this time at the rate of two million tons a year and the question of providing still more staiths was forced upon them by the rapid growth of the trade of the port.

In 1894 powers were applied for to connect Blyth with the main line by a line, two miles and a half in length, from Newsham to Cramlington, occupying, as far as it went, nearly the same ground as the Blyth branch which the Newcastle and Berwick Company were authorised to construct in 1845. The principal object of the line was to take passengers from Blyth to Newcastle into the Central instead of New Bridge Street Station. Although it did not touch any of the property of Lord Hastings, he opposed the Bill on the ground that it might be used for drawing off traffic from the old Blyth and Tyne line, in the wayleaves of which he had a large interest. The Bill was passed by the House of Commons, but the Lords insisted on the insertion of clauses in favour of the wayleave owners, and these appearing to the Directors unduly onerous, they felt obliged to withdraw the Blyth branch from the Bill.

A complete account of the various extensions in different parts of the Company's territory would fill a good many pages, but the following examples are selected as typical of the demands for further accommodation that have to be met as occasion arises. In the twenty-five years from 1880 to 1904 the Company obtained no fewer than twenty-three Acts of their own besides those promoted jointly with other Companies, almost all of which sanctioned new works; and it is seldom that some improvement is not in hand.

During 1887 works representing an expenditure of £700,000 were brought into use. One of them was the doubling of the lines between the Manors and Heaton with a new station at Heaton opened on the 1st of April, and a new station at the Manors opened on the 13th of June. Another of the works was the junction line between Darlington and Fighting Cocks,



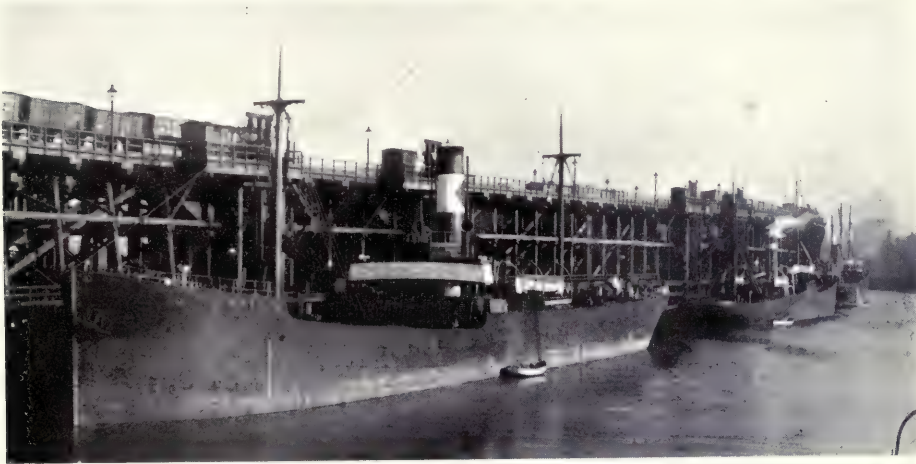
From photo by

DARLINGTON STATION (OPENED JULY 1, 1887).

M. W. Ramsey.

opened for passenger traffic on the 1st of July, together with a new station at Darlington—a large and handsome building on the island principle with dock at the south and bays at the north end, covered by a roof of three spans, each 60 feet wide and 1,000 feet long, and surmounted on the west by a lofty clock tower.

During the year of 1893 several works were completed which were the necessary preliminaries to improvements in the services of trains. One was the alteration of the curves and gradients at Ryhope, Murton and Haswell; another was the doubling of the line between Beelah Viaduct Junction and



DUNSTON JETTY: NEW SIDE AND BASIN.

Kirkby Stephen for the purpose of accelerating the traffic between the east and the west coasts. Other works in progress for the improvement of the existing services were:—The widening of the line between the Central Station, Newcastle, and the Manors, the widening of the tunnel outside of Leeds, the enlargement of the Central Station at Newcastle, the joint station at Leeds, the stations at Bridlington, North Stockton and other places, and the replacement, on various parts of the system, of cast-iron by wrought-iron bridges.

On the 24th July, 1893, a short line between Sherburn House and Durham (Elvet), crossing the Wear by a graceful arch of 130 feet span was opened for traffic, the old line between Sherburn House and Shincliffe being closed and subsequently abandoned. On the 16th of October new staiths at

Dunston were opened, together with the Dunston extension line ($2\frac{1}{2}$ miles), the loop which connected the staiths with the Redheugh branch and a portion of the Team Valley and Annfield Plain branch, between Ouston Junction and Stella Gill. The staiths, the first pile of which had been driven in on the 26th of August, 1890, were 1,709 feet in length, having three shipping-berths, about 260 feet apart, with two sets of side-tipping spouts to each, the lowest 35 feet and the highest 43 feet above high-water mark. The staiths were worked similarly to those at Blyth. The remaining part of the Annfield branch ($6\frac{3}{4}$ miles) was opened for mineral traffic on the 13th of November.



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COAL-SHIPPING JETTIES, TYNE DOCK.

The line was one severe gradient, rising 654 feet in $7\frac{1}{2}$ miles, an average inclination of 1 in 60. The excavations were more than usually heavy, one cutting near Beamish Station, about a mile in length with an average depth of 25 feet, having produced 250,000 cubic yards of spoil.

In 1894 the enlargement of the Central Station, Newcastle, was completed, the additions comprising a large hotel (opened October 3rd, 1892), two new arcades and additional lines and platforms on the south side, new booking-hall, entrance, platforms, and fish and loading dock at the east end. Extensive alterations were also made, including the shifting and straightening of lines and the lengthening of platforms. Several characteristic bits of old Newcastle disappeared in the course of the extensions—the Postern, the Back Row,

Bailiffgate, Victoria Place and other old property in Forth Street (which was set back) as well as portions of the town walls. On the 1st of November the deep-water entrance at Tyne Dock for vessels of large bulk was brought into use.

The opening of the new arch over Dean Street, Newcastle, on the 9th of June, 1894, side by side with the picturesque arch of 1848, marked the completion of the doubling of the line between the Central and Manors Stations, and greatly relieved the pressure of the traffic at this point of the system. In throwing this lofty granite arch of 106 feet span over Dean Street, the engineer—Mr. Charles A. Harrison—accomplished an admirable piece of work, the architectural effect of the two adjoining arches being no less impressive and fine than that of the original structure of 80 feet span. At Leeds the Company completed the widening of the line between Neville Hill and Marsh Lane Station and the enlargement of Marsh Lane Station which, like similar works at Newcastle, facilitated greatly the working of the traffic.

DEVELOPMENTS AT HULL.

At the beginning of 1880, the whole of the Docks at Hull were owned by the Hull Dock Company, while the whole of the Railways serving the Port belonged to the North Eastern Company. In the ensuing session, a new factor was introduced into the situation by the incorporation of the Hull, Barnsley and West Riding Junction Railway and Dock Company—usually called “The Hull and Barnsley.” At this time the four Companies chiefly interested in the traffic of that port were working harmoniously together. Every facility had been given to the Manchester, Sheffield and Lincolnshire Company for the development of their traffic at Hull, and so well had the North Eastern performed the service of carrying the traffic handed over to them by the Great Northern and the Lancashire and Yorkshire for delivery in Hull that these Companies were quite content to allow the running powers conceded to them to remain unexercised. The North Eastern, Lancashire and Yorkshire, and Manchester, Sheffield and Lincolnshire Companies were subscribers to the capital of the Hull Dock Company and had representatives upon the Board. It was to the



interest of the North Eastern and the Dock Company alike to provide adequate accommodation for the growing trade of the port. The former had expended nearly £450,000 since 1872, in additional sidings and warehouses at Hull, and had obtained powers in 1878 to make, at a cost of £20,000, a line from their Hull and Withernsea branch to the site of a proposed new dock at Salt End, two or three miles to the eastward of Hull. The latter had already expended about £400,000 on the works of the present William Wright and St. Andrew's docks—at this time in course of formation—and would no doubt have proceeded to put into execution their plans for another dock of 25 acres at Salt End, with an embankment or river-wall from Salt End to the eastern boundary of the borough, had not the Corporation imposed such very onerous conditions upon them that, after carrying a Bill for the authorisation of these works through both houses of Parliament, it was deemed expedient not to ask for the Royal Assent.

When it became evident that this scheme was shelved, Colonel Gerard Smith, a partner in an old Hull banking house, at the suggestion and with the co-operation of Mr. Robert Galland, a member of a well-known firm of London solicitors, brought out a double-barrelled scheme for a railway into Hull from the centre of the South Yorkshire coal-field near Barnsley and a deep-water dock on the foreshore of the Humber. The railway was really a combination of two older projects—the Hull and Barnsley Junction of 1845 and the Hull and West Riding Junction of 1862. It followed generally the course of the earlier line to Howden, and of the later line from Howden, across the Yorkshire Wolds, by way of North Cave and Kirk Ella to Hull. The new scheme was launched at a meeting held in the Station Hotel, Hull, on the 28th of May, 1879. It met with the cordial approval of the Corporation, who agreed to sell 126 acres of land to the new Company and to subscribe £100,000 towards their capital. The land was to be sold subject to somewhat stringent conditions—that the Company should not sell, lease or transfer the management to any other Company or even enter into any joint purse agreement with another Company without the consent of the Corporation.

The railway and dock were estimated to cost four million pounds. That was an enormous sum to raise, but then, was there not a prospect of a million tons of coal a year passing over the railway for shipment at Hull? Hull was well aware of the advantage which the northern ports possessed in being able to offer return cargoes to ships entering their docks with timber, grain and general merchandise, and felt aggrieved that the railway companies had not done more to develop its coal export trade. The progress of the northern

ports was almost regarded as an affront to Hull. "You have only to unfurl a flag with 'Hartlepool' upon it," said Sir Edmund Beckett, in addressing a Select Committee in 1880, "and Hull takes fire immediately." The so-called equal rates from all the grouped ports of the North-East Coast to the great commercial centres of Yorkshire had always been so many irritating points of difference between the traders of Hull and the Railway Company, and any scheme was assured of support in Hull that promised to increase the shipment of coal from that port.

Plans of the proposed railway and dock were deposited in January, 1880, and early in June the Bill reached the committee stage in the House of Commons. It was the largest scheme, as regarded capital, which had come before Parliament since the introduction of the Great Northern Bill in 1845. In presenting their case the promoters endeavoured to show that Hull had been starved and neglected by the North Eastern and that its trade had been crippled by unfair railway rates and heavy dock dues. The timber trade of the Hartlepoons, they declared, was being fostered at the expense of Hull, and the produce of the Yorkshire coal-fields, for want of proper shipping appliances at Hull, was being diverted to Grimsby and Goole. The effect of these allegations was rather spoilt by the tables of imports and exports which the promoters put in to illustrate the commercial importance of the port. The timber imports both of Hull and Hartlepool for the year 1878 showed a substantial increase over those for 1870, but while the percentage of increase at Hartlepool was $8\frac{3}{4}$, at Hull it was 36. As to the coal-export trade of Hull, it had advanced from 193,106 tons in 1870 to 463,819 tons in 1879, notwithstanding the inadequate provision of shipping appliances at the docks, while that of Grimsby had only increased from 290,642 tons to 332,633 tons. The rapid progress of Hull as revealed by the Board of Trade returns was a sufficient refutation of the statement that the North Eastern had been "nursing" the northern ports and displaying unbusinesslike indifference to the interests of the great port at the south-eastern corner of their system. Mr. Tennant showed that even if the new Company got hold of the whole of the traffic then passing over the North Eastern between Hull and the various places to which the competing line had access, as well as the whole of the Dock Company's revenue, they would not be able to pay an adequate dividend on their large capital.

The Dock Company had a specially strong reason for desiring the rejection of the Bill. Under their Act of 1861 they were bound to consent to the formation of a Dock Trust, should the Corporation make application to Parliament for the purpose. The powers of the Act could, of course, be more

advantageously exercised by the Corporation if the Dock Company's property were depreciated, and nothing would have a greater tendency to bring down the market value of the shares than the authorising of a rival dock.

Three days before the great Parliamentary struggle came to an end, while the North Eastern case against the Bill was being rounded off by the expert evidence of Mr. Tennant and Mr. Harrison, the new docks between Hartlepool and West Hartlepool harbours, owing to an unexpected emergency, were informally opened for traffic. The accommodation for shipping at the Hartlepoons now consisted of seven docks, two tidal basins,



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UNION AND CENTRAL DOCKS, WEST HARTLEPOOL.

two tidal harbours and four timber ponds, with a total water area of 200 acres, besides timber yards, quays and sidings to the extent of about 150 acres, whereas Hull, which had seven docks in use—two of them older than the railway system itself and two timber ponds—had a total water area of only 114 acres, excluding a dock of 11 acres under construction. The superior dock accommodation, the better coal-shipping facilities and the lower port charges of Hartlepool were advanced as so many reasons for passing the Hull and Barnsley Bill. Upon these and similar considerations turned the decision of the Committee who, on the 9th of July, 1880, after striking out one of the branches and restricting the running powers into Barnsley, declared the preamble of the Bill proved. The Bill, as amended, was

opposed in the House of Lords without success and received the Royal Assent on the 26th August, 1880.

On the 16th of July, 1885, there was public rejoicing at the opening of the Alexandra Dock by the Hull and Barnsley Company. Both dock and railway had been constructed in the comparatively short period of four years and a half in the face of enormous difficulties. At one time suspended on account of the failure of the Company to raise money by the issue of 5 per cent. preference stock, the works had only been brought to completion by the indulgence of Parliament in setting aside one of its own rules and allowing the Company with a share capital of £3,000,000 to borrow to the extent of £2,500,000. The railway was opened for goods and mineral traffic on the 20th of July, and for passenger traffic on the 27th. The Hull Dock Company and the North Eastern had now to reckon with the competition of the "Hull and Barnsley." The Dock Company resolutely withstood every attempt to draw away their regular customers, meeting rebate with rebate and allowance with allowance until the diminishing receipts from dues fell below the level of the working expenses. The effect on the North Eastern was to reduce the shipment rate for the South Yorkshire coal traffic from 3s. 1d. to 2s. 10d. And what of "the promised land of Commerce" which, according to Colonel Smith, lay "within reach of Hull" on that memorable 16th of July? The result of five months working of dock and railway was a gross revenue of £54,848. The net revenue was £6,710, upwards of £50,000 short of the amount required to pay even the debenture interest.

On the 1st of February, 1886, the North Eastern made another move in opposition to the Hull and Barnsley. They reduced the differential rate from the West Yorkshire collieries from 2s. 2 $\frac{3}{4}$ d. to 1s. 11 $\frac{3}{4}$ d. The Hull and Barnsley replied by reducing the rate from four of their South Yorkshire collieries from 2s. 10d. to 2s. 7d. The North Eastern did not follow suit, but on the 12th of April the Lancashire and Yorkshire began exercising their long dormant running powers into Hull and, setting up a carting establishment there, joined actively in the competition for traffic.

By the end of 1886 the Dock Company and the Hull and Barnsley had so seriously injured one another by the war of rates that the former found it necessary to apply for power to lease or sell their estate to one or more of the great railway companies, and the other had to submit to the appointment of a receiver at the instance of the debenture holders. The extent of the mutual injury inflicted may be gauged by the depression in the value of their respective stocks, the consolidated stock of the Dock Company falling during

1886 from 49 to 40 and the ordinary stock of the Railway Company from 34 to $14\frac{1}{2}$.

At the beginning of 1887, the situation became complicated by an unexpected move—or rather stand—on the part of the Hull and Barnsley Company. In accordance with the powers of their Act of 1880 they had all but completed a short branch at Sculcoates to connect the North Eastern system with their own when they saw that the branch might be used against them by the North Eastern, and they refused to form the actual junction between the two railways. As it was clear they did not mean to afford the facilities which Parliament had sanctioned, there was no course open to the North Eastern but to ask Parliament, in the interest of traders wishing to forward or receive traffic by their railway to or from the Alexandra Dock, to give them power to acquire and finish the branch.

When the North Eastern Bill of 1887, which contained clauses for making this connection, came before the Committee of the House of Commons it was stoutly opposed by the Hull and Barnsley Company, who contended that the junction line and dock should be opened to the North Eastern for non-competitive traffic only, that is to say, for the traffic of places on their line between which and the Alexandra Dock the North Eastern Railway formed the only route. To this the North Eastern could not assent, and after much wrangling before the Committee they withdrew this part of their Bill, leaving the Hull and Barnsley masters of the situation.

In these circumstances the position of affairs at Hull demanded the most watchful attention of the North Eastern Board. Falling deeper and deeper into debt, the Hull and Barnsley had been drifting towards a working arrangement with one of the larger companies. On grounds of railway policy they naturally looked to Derby for deliverance from their troubles, for the Hull and Barnsley line formed the most direct route to Hull from the system of the Midland Company. The Midland were quite willing to work the line at a fair percentage of the gross receipts and to substitute their own debenture stock at $3\frac{1}{2}$ per cent. for the debentures and liabilities of the Hull and Barnsley Company, but they were not prepared to sacrifice the interests of their own shareholders for the benefit of the people of Hull by continuing the reckless war of rates with the North Eastern. The proposal met with the determined opposition of the coal-owners and was regarded with little favour by the people of Hull, who thought they derived more benefit from the low dock charges than they could hope to gain from the working of the line as a commercial undertaking. The North Eastern clauses in the Bill promoted by the Midland and Hull and Barnsley Companies aroused the antagonism of the

Corporation, who contended that the Bill was no longer one for giving the Midland Railway access to Hull, but for restoring the monopoly of the North Eastern. The matter was referred to the shareholders and, at an adjourned meeting held on the 7th of May, the resolution approving of the agreement was lost. The negotiations between the two companies therefore collapsed.

Meanwhile the North Eastern and the Hull Dock Companies had been exchanging views on the subject of a working agreement; but no practical results were arrived at, and the next move was made by the Hull Corporation. In June 1888 they propounded a scheme for placing the docks of the old Dock Company and the Hull and Barnsley Company under a Trust, paying off all the debts of both Companies and making the Hull and Barnsley line the high road into Hull for all the Railway Companies to run over. This scheme they embodied in a Bill, a draft of which was presented to the Dock Company and the Hull and Barnsley Company, but these Companies would not accept it and it got no further. The Hull Dock Company then tried to arrange a *modus vivendi* with the Hull and Barnsley Company, but without success, whereupon they resumed negotiations with the North Eastern and the terms of a working agreement were provisionally settled. A Bill promoted by the Dock Company in 1889 contained clauses relating to the working agreement with the North Eastern Company, but a Committee of the House of Lords declined to pass it, a decision which accorded with the views of the people of Hull, who complained that no material guarantee had been given by the North Eastern Company that they would maintain, extend, and improve as well as work the docks. The Hull and Barnsley Company, finding that the Midland Company did not intend to renew their previous offer, threw out a feeler to ascertain whether the North Eastern Company were prepared to negotiate for the purchase of their railway and dock. They were informed that if a certain proposal were made it would in all probability lead to an agreement. This proposal was that the North Eastern Company should (1) satisfy the debenture holders in regard to principal and interest accrued to date of transfer and pay off the other creditors of the Company and (2) secure to the shareholders a dividend upon their capital of £3,300,000 commencing at $\frac{1}{4}$ per cent. in 1890, and rising to $1\frac{1}{2}$ per cent. in 1894, supplemented in 1895 by a bonus of $\frac{1}{4}$ per cent. if the North Eastern Company should pay over 6 per cent. and up to 7 per cent. on their consols, and $\frac{1}{2}$ per cent. upon each 1 per cent. which the North Eastern Company might pay over 7 per cent. Colonel Smith, having come to the conclusion that "it was only by annexation to a great Company or by seeking the aid of a great Company's

credit that the ordinary proprietors of the Company could, with the goodwill of the debenture holders, get any return for their money," wished to submit the terms to a Wharnccliffe meeting of the proprietors, but the Board decided that they were not such as ought to be proposed to a Wharnccliffe meeting and this decision was endorsed by a large majority of the shareholders at the half-yearly meeting.



From coloured print.

HULL DOCK OFFICES (OPENED OCT. 12, 1871).

In the session of 1891, the most important business was the settlement of the question of the future relations of the North Eastern with the Hull Dock Company. The Dock Company had asked the North Eastern to provide the requisite capital for making a deep-water entrance to the Albert Dock and for paying off their bond debt, and a Bill of the Dock Company was deposited to sanction an arrangement which would necessarily increase the interest of the North Eastern in the Hull Docks. But this proposal was defeated at a Wharnccliffe meeting of the Hull Dock shareholders. Things could not remain as they were. The fishing

trade at Hull required not only more quay space and water space, but increased facilities for bunkering the steam trawlers and cutters which had been coming so extensively into use since 1885. The coal trade required a greater depth of water on the dock sills for vessels of the larger type, besides additional coal shipping appliances. For these purposes the Dock Company wanted £60,000 and asked the North Eastern to advance this sum, but the latter had no statutory powers to expend money upon an estate which was not their own.

The idea of an amalgamation between the two companies was suggested, and in November 1891 the matter was provisionally settled on the basis of an exchange of £1,935,835 in nominal value of North Eastern stocks for £3,568,416 in nominal value of the Dock Company's; the North Eastern also to take over the debts and liabilities of the Dock Company amounting to £304,211.

In considering what would have to be done to provide accommodation for vessels of great draught, the North Eastern directors came to the conclusion that relatively better results would be obtained by expending £1,000,000 on a new dock than by spending £22,000 on the deepening of the entrance to the Albert Dock, and they applied in the session of 1892 for powers to construct a deep-water dock at Marfleet to the eastward of the Alexandra Dock while promoting jointly with the Dock Company a Bill for the amalgamation of the two undertakings.

This proposal to make a deep-water dock undoubtedly gained for them a good deal of local support and secured a favourable reception for the amalgamation scheme, but as the sequel showed, it brought trouble in its train. Much as the Hull and Barnsley Company objected to seeing the old docks in the hands of the North Eastern, they objected still more to having a rival dock, with accommodation for larger vessels, constructed alongside of their own, and they opposed the Bills on the ground of unfair competition. The Corporation also petitioned against the Bills, but withdrew their opposition upon certain conditions, one of these being that the two Bills should stand or fall together. They feared that if the North Eastern got the new dock Bill alone they might exercise their powers to the prejudice of the Dock Company; and that if they got the amalgamation Bill without the new dock Bill they might be tempted to reconsider the question of spending a large amount of capital for the development of the trade of Hull. The strength of the case against the Bills lay in the contention

of the Hull and Barnsley Company that the North Eastern proposed not only to acquire the old docks, but to put a large new competing dock on the other side of the Alexandra Dock presumably for the purpose of crushing and destroying them. A committee of the House of Lords apparently failed to discover any justification for this assumption, and passed the North Eastern Company's proposals without substantially altering them. A committee of the House of Commons attached more importance to the Hull and Barnsley point of view. In the course of their inquiry, an unfortunate episode occurred. The chairman of the committee suddenly discovered that he was a North Eastern shareholder and, as such, disqualified from taking any part in the proceedings. He therefore retired and, notwithstanding the protest of the counsel for the North Eastern Company, the speaker ruled that it was competent for the other three members of the committee to proceed with the inquiry. The upshot was the rejection of both the Bills. This happened on the Friday, and Parliament was dissolved on the following Tuesday. There was thus no opportunity to ask the House to review the decision and either send the Bills back to the same committee or hang them up until another session, so the problem of the Docks at Hull remained unsolved.

Having seen in the previous session that it was no use trying, so to speak, to drive two omnibuses abreast through Temple Bar, the North Eastern Company re-introduced the Bill for amalgamation, in 1893, and dropped the other. Owing to an outbreak of labour troubles at Hull, which kept the principal witnesses engaged at the port, the hearing of the Bill had to be postponed to a late period in the session. For six weeks the dockers at Hull remained out on strike—not for higher wages, but because men who did not belong to the Union were employed in loading and unloading ships. The lightermen, watermen and oil-fillers ceased work in sympathy with the dockers, thus bringing the whole business of the port to a standstill. Deplorable scenes of bloodshed and violence occurred in the streets and around the docks. Gunboats arrived in the Humber, dragoons paraded the streets with drawn swords, the police were obliged at times to use their batons to disperse the crowd. The strike ended in the defeat of the dockers, and the trade of Hull resumed its normal course.

On the 1st of June, the Bill came before a select committee of the House of Lords. By this time clauses had been agreed with the Hull and Barnsley Company which removed any real or imaginary ground for apprehension on the part of that Company. In the first place, they prohibited the North Eastern from reducing their dock dues below those of their rivals except by

agreement or arbitration. In the second place, they fenced round the question of additional dock accommodation with provisions which completely safeguarded the Hull and Barnsley interests. Before the North Eastern could proceed to construct a dock eastward of the river Hull they had to give notice of their intention to the Hull and Barnsley Company. The latter, having spare lands adjoining the Alexandra Dock, might then require the North Eastern to construct the dock on that site, and they might further require it to be constructed as a joint undertaking. It was not even necessary that they should provide their share of the capital; all they had to do was to pay interest at the rate of 4 per cent. per annum on half of the amount expended by the North Eastern in the construction of the dock.

Though there was nothing in these clauses which impaired or threatened the independence or competing powers of the Hull and Barnsley Company, the Hull Corporation regarded them with distrust. The expressed opinion of the Corporation was that these clauses marked the beginning of a joint-purse arrangement which they considered opposed to the whole spirit of the original Hull and Barnsley Act. The very head and front of the North Eastern Company's offending in the eyes of the Corporation was the dropping of the Bill for the deep-water dock, the simple expedient of taking one thing at a time being construed into a breach of faith, a disloyal change of front. To a shrewd body of representative business men like the Hull Chamber of Commerce, the fact of the North Eastern Company investing three millions of capital in Hull was a sufficient guarantee that they would do their utmost to develop the trade of Hull. The Corporation required further assurances. They conceived it possible that the North Eastern might allow things to remain as they were, content with a small return upon the capital sunk in the docks, provided they could transfer the traffic to ports from which they had a longer run into the interior of the country secure from water competition. What the Hull and Barnsley apprehended, before the offer of the protecting clauses, was that the North Eastern would lower their rates to starvation point. The Corporation on the other hand were afraid that, if the powers sought were granted, the North Eastern, in collusion with the Hull and Barnsley, would put up the rates to the prejudice of the trade of Hull. A significant commentary on this contention was the petition of the River Tyne Commissioners against the Bill on the ground that the North Eastern, having such a large monetary stake in Hull, would divert traffic from the Tyne to the Humber and tax North-country traders to pay for the benefits conferred on the Hull shipowners by reductions in the dock charges.



N. Whitlock, del.

ENTRANCE TO QUEEN'S DOCK, HULL, (1829)

W. J. Cooke, sc.

Leading representatives of the trading interests at Hull like Mr. Charles Wilson, M.P., and Mr. Frederick Brent Grotrian, who had formerly been the strongest opponents of the North Eastern policy, now came forward to show how vital to the trade of the port the amalgamation was, especially in view of the future competition of the Manchester Ship Canal. In the light of the evidence given by the shipowners, merchants, and traders of Hull the objections of the Corporation appeared somewhat unsubstantial.

The committee of the House of Lords decided to pass the Bill, but taking hold of a statement in the North Eastern chairman's speech to the shareholders in February that, if the Company got possession of the docks, something like half a million of money would be required to put them into good working order, they passed the Bill subject to the condition that within a period of seven years the North Eastern should expend that amount in improving the docks and adapting them to modern requirements. Clauses for the benefit and protection of the Corporation having been subsequently inserted in the Bill, it was passed by a Committee of the House of Commons and received the Royal assent on the 24th of August, 1893. The amalgamation took effect as from the 1st of July, the docks, etc., added to the North Eastern system being the following:--

Name of Dock.	Date Opened.	Water Area.			Depth of Water on Sill.						
					Average Spring Tides.		Average Neap Tides.				
		A.	R.	P.	Ft.	In.	Ft.	In.			
Queen's	1778	9	3	29	20	6	14	6			
Tidal Basin ... ..	...	0	1	22						
Humber	1809	7	0	24	26	6	20	6			
Tidal Basin ... ..	...	2	1	19						
Prince's	1829	6	0	5	20	6	14	6			
Railway	1846	2	3	9	26	6	20	6			
Victoria	1850	20	0	4	27	6	21	6			
Drypool Basin...	} and dock extended in	1	0	8	22	0	16	0			
Half Tide Basin		3	0	0	26	0	20	0			
Tidal Basin		2	3	7	27	6	21	6			
Drypool Tidal Basin...	1852	0	1	32	22	0	16	0			
Albert	1869	24	2	18	28	3	22	3			
Tidal Basin ... ..	...	1	3	37						
Channel ... ..	...	0	3	4	...		...	
William Wright	1880	5	3	37	28	3	22	3			
St. Andrew's	1883	10	2	10	28	11	22	11			
Tidal Basin ... ..	...	0	2	0						
Water Area of Docks and Basins		A.	R.	P.							
Timber Pond, No. 1		100	1	25							
" " No. 2		14	0	4							
" " " Extension		11	1	1							
		14	2	20							
Total Water Area ...		140	1	10							

The addition to the North Eastern capital in consequence of the purchase of the Hull Dock estate was two millions and a quarter.

One of the first questions which claimed the attention of the Company when the Hull Docks came into their possession was that of the accommodation for the fishing trade at Hull. Plans were at once prepared and passed for the construction of a ten-acre basin, three slipways, a river-wall and jetties at St. Andrew's Dock at an estimated cost of £70,000 or £80,000, and in June, 1894, the work was put in hand.

With regard to general traffic, the competition of the Manchester Ship Canal was now beginning to be felt in Hull, and the question of improved accommodation was becoming urgent. Powerful dredgers were at work deepening the interior of Victoria dock, and not only was it proposed to improve the entrances of the old docks, but to construct another deep-water dock. The North Eastern could not, of course, deepen the entrances of the old docks without depriving the Hull and Barnsley of their special advantage as the possessors of the only deep-water dock at Hull, and they were prevented by the terms of the agreement of 1893 from constructing another deep-water dock or from reducing their dock charges except by arrangement with the Hull and Barnsley Company. The first step, therefore, towards any improvement of the port seemed to be an arrangement for the combination of the railway forces. Once more the directors of the two Companies came together to discuss the possibility of a union, and for the second time terms of amalgamation were arranged. The terms were briefly these: the first debenture holders of the Hull and Barnsley to receive £100 and the second debenture holders £115 of North Eastern 3 per cent. debenture stock for each £100 of their holdings; the ordinary shareholders to exchange their stock for North Eastern preference stock bearing interest at the rate of 1 per cent. for two years from date of transfer, $1\frac{1}{4}$ per cent. for the next two years, and then $1\frac{1}{2}$ per cent. in perpetuity, with the addition of a bonus if the dividend on North Eastern consols exceeded 6 per cent. As the ordinary shareholders of the Hull and Barnsley Company had only once since the opening of the line received a dividend—and that at the fractional rate of 7s. 6d. per cent.—the terms offered to them seemed fair and even liberal, but the local shareholders declined to accept them and commenced an agitation to “enforce a settlement commensurate with the progressive character of the line and the immense advantages which it would confer upon the North Eastern Railway.” Public opinion in Hull was generally antagonistic to the union of the two companies, and there was a revival of old prejudices



J. Stead, lithog

Frank N. Pettigall, del.

BIRD'S EYE VIEW OF HULL, 1880.

Showing six of the eight docks acquired by the North Eastern in 1893.

- | | | | | |
|----------------|------------------|-----------------|----------------|-----------------|
| A Old Harbour. | B Queen's Dock. | C Princes Dock. | D Humble Dock. | E Railway Dock. |
| | F Victoria Dock. | G Albert Dock. | | |

(From a print in the *Wolverforce Museum, Hull*.)

and apprehensions which were calculated to blind the people of Hull to the larger interests of the port. The attitude of the Hull Corn Trade Association and of the Hull Chamber of Commerce was suspicious and hostile. The principal representatives of the great shipping interests, however, took a more favourable view of the scheme and urged the trading bodies to support it. A Bill for the amalgamation was deposited, subject to the consent of the Corporation being obtained, but after a conference with the Parliamentary Committee of the Corporation the North Eastern Board realised that, in view of the number of resolutions sent to them in opposition to the scheme, the Corporation could not give their consent, and the Bill was withdrawn.

In the session of 1897 the North Eastern applied for Parliamentary powers to carry out improvements at Hull. These included a river-wall from the William Wright dock to the Victoria dock basin, additional quay-room in the space enclosed by the river-wall, a new dock on the site of the island wharf having a water-area of ten acres, and new entrances and locks to the Albert and Humber docks, the estimated cost being £781,000. In promoting their Bill the Company were opposed by the Hull Corporation, by the Humber Conservancy Commissioners (who sought to impose upon them obligations with respect to the dredging of the navigable channel of the Humber estuary), by the Great Central Railway Company and the Aire and Calder Navigation acting in conjunction with other bodies interested in the river traffic. Just before the Bill went into committee the promoters came to an arrangement with the Corporation and before the final stage was reached the Conservancy Commissioners offered terms as to dredging which the North Eastern were prepared to accept. For reasons not quite apparent the Committee insisted upon the retention of the clauses as originally drawn up by the Corporation and the Conservancy Commissioners, but sooner than accept the responsibilities thus saddled upon them, the Company withdrew the Hull dock works from their Bill.

In the following session, 1898, the North Eastern Company went to Parliament with another series of important works which comprised the Hull dock improvements withdrawn from the Bill of 1897 with large additions and modifications, viz.:—an extension of the Victoria dock eastward for the accommodation of the timber trade, the enlargement of the area of storage ground and the provision of coal sidings to serve the new jetty in Victoria dock.

These improvements were dependent upon the acquisition of a piece of ground belonging to the Corporation known as the “western reservation.”

It was obvious to the Hull and Barnsley that if they could obtain possession of this piece of land the North Eastern would have to give up the idea of the Victoria dock extension and they also deposited a Bill which contained provisions for the purchase of it.

The Corporation having obtained clauses from the North Eastern for the ample protection of their interests now sought to lay upon them the burden of abolishing the level crossings around Hull. The burden was no light one, and the North Eastern suggested that the Corporation should



SITE OF HULL JOINT DOCK.

pay half the cost of the work, but this they declined to do. The Humber Conservancy Commissioners, whose objections to the previous Bill had been met by a dredging clause, raised again in a modified form the question as to the responsibility of the channel of the river after the completion of the Company's works. The result was that the North Eastern decided to abandon the Bill.

In these circumstances, the North Eastern fell back on the arrangement sanctioned by Parliament in 1893 for the construction, jointly with the Hull and Barnsley, of a dock to the east of the Alexandra dock, and they accordingly entered into an agreement with the Hull and Barnsley for



From a painting by

COTTAGE IN WHICH GEORGE STEPHENSON WAS BORN
 (with view of Scotswood, Newburn and Wylam Railway).

E. Hodgson.

the purpose. By this change of plan they won over that Company to their side, and evaded the additional expenses which might otherwise have been forced upon them. The Hull and Barnsley granted to the North Eastern Company running powers to the Joint Dock over their railway at Hull, and the North Eastern Company gave the Hull and Barnsley the right of running into and using the Paragon Station.

In the session of 1899 a Bill was deposited to give effect to the agreement. The Hull Corporation opposed the Bill in each House, but it was nevertheless passed under the title of "The Hull Joint Dock Act, 1899," without any substantial modification, and with the opening of the new century there seemed a prospect of a permanent cessation of the mutually injurious competition between the two Railway Companies.

EQUIPMENT AND MANAGEMENT.

The Stephenson Centenary, which was celebrated at Newcastle-upon-Tyne on the 9th of June, 1881, gave the North Eastern Company an opportunity to illustrate, by means of a remarkable procession of typical modern engines, seventeen in number, the progress of locomotive design and construction, not only on their own system, but on six of the other great railways of the country. Starting from Gateshead, this unique procession, headed by the fine North Eastern passenger express engine No. 363, one of the 901 class, built in 1880, steamed across the High Level Bridge to the Central Station, and after a short stay there, proceeded by way of Scotswood and Newburn to North Wylam, passing in front of George Stephenson's birthplace. Returning to Newcastle, the engines were shunted into the Infirmary sidings for public inspection, a striking contrast being furnished by the presence of two of the old Stockton and Darlington engines—"Locomotion" (1825) and the "Derwent" (1845), the Killingworth engine "Billy" (1830, practically rebuilt about 1867), the Canterbury and Whitstable engine "Invicta" (1830), a small engine with upright cylinders from Hetton Colliery (1851-2, rebuilt in 1874) and an early engine built by Messrs. England and Company, of London, called the "Dwarf." Five other North Eastern engines, besides No. 363, were on view, viz.:—express passenger engine No. 1268 (rebuilt in 1881); bogie tank passenger engine No. 1000 (built 1880); goods engines No. 626 and No. 484 (built 1881) and bogie passenger engine No. 1435 (built by R. & W. Hawthorn, 1875.) A living link between the "Invicta" and No. 363 was supplied in the person of Mr. Edward Fletcher, the veteran locomotive superintendent of

the North Eastern Railway, who had driven the one in 1830 and designed the other in 1880. The celebration was a tribute to the memory of one of the world's greatest benefactors, and a pageant in honour of the progress of steam locomotion. But already a greater power than steam had been applied to the purposes of transport, not a month having elapsed since the first electric car began running for public service in the suburbs of Berlin between the Cadettenhaus and Lichterfelde.

The introduction of "workmen's trains" on the Riverside branch, between Newcastle and North Shields, on the 6th of December, 1880, marked a new stage in the development of railway facilities, although workmen's trains were not quite a novelty on the North Eastern system, having been run by the old Stockton and Darlington Company between Middlesbrough and Eston at least as early as 1852. The tickets by the Riverside line were sold in double-journey sets of six, the price being 1s. 6d. per set to stations up to Willington Quay and 2s. per set to Percy Main and North Shields. Workmen who had formerly travelled by the river steamboats were not slow in taking advantage of these cheap trains. The first development of the system was the concession to workmen living at North Shields to travel with the new tickets by certain trains on the old North Shields line. Then followed a further concession to men employed on the night shifts in works and factories in the neighbourhood of Howdon, the tickets being made available for use by one of the ordinary afternoon and two of the early morning trains.

The more general question of ordinary passenger fares was also demanding consideration at this time. In 1880 the receipts from first and second class showed a decrease of £150,000 compared with those of 1875. There was a decrease in the number of first-class passengers of 32 per cent. and in the number of second-class of 40 per cent. How to fill their empty carriages, was the problem which faced the directors in 1881. They decided to reduce their first and second-class fares, calculating them at 1½d. per mile for first-class and 1¼d. per mile for second-class, plus government duty. Arrangements were made to give effect to this resolution on the 1st of July, 1881. The results of the revision were seen at the end of the half-year. There was an increase in the number of first-class passengers of 15,000, but a decrease in the revenue from this class of traffic of £7,740; and there was a falling-off in the number of second-class passengers of 26,000. The total loss in revenue on the first and second-class passenger traffic was £11,731. But against this there was an increase of £39,000 in the receipts from third-



1. FOUR-WHEELED THIRD-CLASS CARRIAGE (FOUR COMPARTMENTS), 1875.
2. SIX-WHEELED THIRD-CLASS CARRIAGE (FIVE COMPARTMENTS), 1887.
3. E. C. J. S. FIRST-CLASS SLEEPING CARRIAGE, 1895.

class passengers, of whom the Company had carried 1,186,000 more than in the corresponding half of 1880. The travelling public, it seemed, were dividing themselves into two classes. Though unprepared as yet to follow the Midland Company's lead, the North Eastern considered it expedient to reduce their stock of second-class carriages and increase the first- and third-class. The new third-class carriages were of a greatly improved type.

To the many facilities already given to passengers in their district the Company made several notable additions in 1896. For some time they had issued to commercial travellers tickets covering large areas at very low rates. This year they extended to traders and others the benefit of the zone arrangement, issuing first-class tickets over eight defined portions of the system at fixed rates of £25 to £30 a year, according to the area covered. If the holder required to extend the bounds of his district, he could do so on payment of 2s. 6d. for every mile beyond the zone. A few months later they introduced the "thousand-mile ticket," which was quite a novelty at this time in Great Britain. From the 1st of July books of coupons were obtainable, representing a thousand miles of travelling on the North Eastern Railway in any direction within a year of the date of issue at the rate of 1½d. per mile (first-class), available not only for the purchaser but for members of his family and even for his guests. Week-end tickets were introduced this year for the use of commercial travellers going home on Friday or Saturday and returning on the Sunday or Monday, and return tickets on special terms for the use of members of golf clubs visiting distant links. The ordinary week-end tickets were also extended to a number of additional stations.

Notable improvements were made at this time in the rolling-stock on the main line and the Leeds and Scarborough branch. On the night trains a new form of sleeping-car was introduced containing six single-bedded and two doubled-bedded compartments which were also fitted up as dressing-rooms, the berths being placed cross-wise, instead of length-wise as in the Pullman cars, with the top next to the corridor. Several new trains were built for the East Coast and Leeds and Scarborough service with the very latest appliances for comfort and convenience. These were put into service on the 1st of July. One of the latter was tried on the 9th of June between Newcastle and Tweedmouth, an event of more than ordinary interest, for not only did the carriages mark an advance in luxury and comfort upon anything in use, but the engine was the most powerful which had ever been placed upon a railway. No. 1869 was one of two locomotives built by Mr. Wilson Worsdell for the East Coast express traffic, having 20-inch cylinders with a

26-inch stroke, leading bogie, and coupled driving and carrying wheels of 7 feet $7\frac{1}{4}$ inches—six inches greater than those of any other four-coupled engine running.

Only two serious accidents have to be recorded during this period of twenty-five years. The one on the 19th of August, 1889, which was due, like the accident at Morpeth in 1877, to excessive speed on a sharp curve, occurred at Ryhope, near Sunderland, the train wrecked on this occasion being the through express from Liverpool to Newcastle, travelling by way of Stockton and Sunderland. After running much faster, it is supposed, than usual, down Seaton Bank, it jumped off the rails on coming to the curve below Ryhope station, the radius of which was only $11\frac{1}{2}$ chains. The couplings between the tender and the first carriage snapped and the engine tore up the rails for some distance and then fell over on its side. The rest of the train rushed past the overturned engine for about a hundred yards and ultimately five carriages toppled over and fell on their sides, leaving the first and last carriages standing. A great number of passengers were seriously hurt—over a hundred of them afterwards made claims for personal injury—but fortunately no one was killed.

The other occurred at the Manor House Siding, between Otterington and Thirsk, on the morning of the 2nd of November, 1892, when the second portion of the 10.30 p.m. Scotch express from Edinburgh to London, consisting of seven ordinary passenger carriages, a Pullman car, a horse box, three vans and a fish waggon, travelling at the rate of sixty miles an hour, ran into a heavy goods train. The accident was due to the mistake of a signalman rendered unfit for duty by physical weariness and mental distress at the death of his child. The first portion of the express having passed at 3.38 a.m. he gave the customary notification to Otterington that the line was clear, and soon afterwards got the call "Be ready" for the goods train, which he acknowledged, and then, overcome with fatigue, dropped off to sleep without obtaining permission of the signalman at the box in advance to let it go forward. His signals accordingly remained at danger, and the goods train came to a stand near the signal-box. Had the driver in the course of the next few minutes sounded his whistle, as prescribed by the rules, the signalman might have been aroused and the accident averted, but this was not done. Meanwhile, the second portion of the express was approaching, and the call "Be ready" from Otterington startled the Manor House signalman out of his sleep. Forgetting, for a moment, all about the goods train, which was standing just beside his "up" home signal, he replied,

"Line clear," thinking that he had omitted to do so when the first portion of the express passed. At the same time he lowered his signals which, of course, opened the line for the goods train. The snorting of the engine of the goods train as it started forward reminded the signalman of his fatal act of forgetfulness. For a moment he was powerless to do anything. He then rushed to the block instrument and asked the signalman at Otterington if the train "on line" was the second portion of the express, and on receiving the answer, "Yes," put the home and distant signals to "danger"; but it was too late, the collision had taken place. After striking the goods train the engine of the express train—No. 178—which had already been in an accident at Marshall Meadows near Berwick on the 10th of August, 1880, bounded off the rails and fell across the fence separating the line from an adjoining field. The carriages between the engine and the Pullman car were violently telescoped into one another, and both ends of the Pullman car driven in. To add to the horror of the scene the débris of the first carriage caught fire from the furnace of the engine and a large part of the wreckage was soon ablaze, the guard's van and several trucks of the goods train being involved in the destruction. Ten passengers were either crushed or burnt to death and 39 seriously injured.

During the earlier part of this period the general management of the railway was in the hands of Mr. Henry Tennant. At the close of 1890 he signified his desire to be relieved from the responsibility of office and it was arranged that he should retire on the 30th April, 1891. To the "ability, knowledge, and tact" of Mr. Tennant and "his remarkable skill in matters of railway policy" the directors paid a fitting tribute in their half-yearly report. Mr. Tennant was elected a member of the Board in the place of Lord Wenlock, who had resigned, and it was understood he would hold for some years a consultative position in the management.

Mr. George Stegmann Gibb, who had been the Solicitor to the Company since 1882, was appointed successor to Mr. Tennant. By his readiness to carry out new ideas and modern methods he made his personality felt, not only on the North Eastern, but throughout a much wider area, and as will be seen, under his vigorous management, many improvements in working were successfully introduced.

Of the various problems which confronted the management at the beginning of the twentieth century there were three of prime importance—the problem of growing expenditure, the problem of the competition of electric tramways which were diverting suburban traffic from the

To face page 726.

PLATE XXXVII.



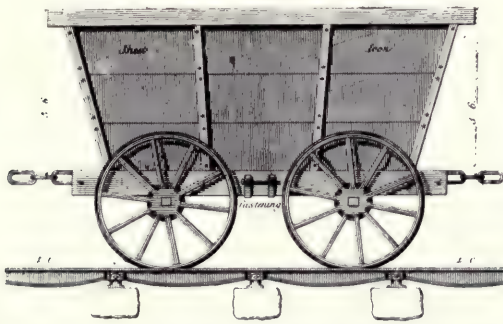
Photo by

Lizzie Caswall Smith.

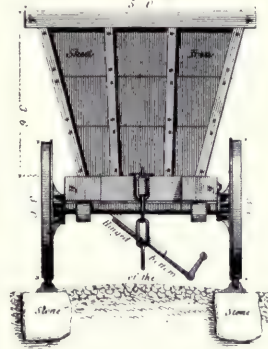
Sir George Stegmann Gibb—General Manager, 1891-1906.

ALPHABET

railway, and the problem of the reorganisation of the traffic department. With regard to the first: one step had already been taken in the direction of economy of working by the building of engines of a powerful type which enabled the Company to increase, to a very appreciable extent, their train loads. In one mineral district the weight of the train was advanced from 576 to 660 tons, in another from 360 to 460 tons. Between Darlington and York and York and Hull, where the number of waggons forming a goods train had previously been 50, trains of 60 waggons were worked with satisfactory results, and when the first eight-coupled engines of class T—which were designed to haul trains of 60 loaded mineral waggons—came out in the autumn of 1901, they were found capable of hauling 72 and even 80 loaded waggons.



From Strickland's "Reports on Railways, Canals, Roads, etc., 1826." Pt. 51.



B. Tanner, sc.

CHALDRON WAGGON, 1826.

Besides increasing their train loads and doing away, as much as possible, with piloting, the North Eastern authorities set themselves to the serious task of reducing the proportion of dead-weight to profitable load—by the use of larger waggons. 90 per cent. of the Company's mineral waggon stock in 1901 consisted of 8 and $10\frac{1}{2}$ ton waggons. The chaldron waggons, of which there were 26,372 in 1863, numbered at this time only 1,862. The first experiments made by the Company with waggons of high capacity were with those carrying loads of 15 and 32 tons. The tare of the former was 7 tons 16 cwt. and that of the latter 13 tons. Waggons of 20 tons capacity with four wheels were built in 1902 and waggons of 40 tons with two four-wheeled bogies in 1903. The 40-ton waggons were 40 feet in length over the buffers, 8 feet in width and 10 feet in height at the sides, with a tare of $14\frac{1}{4}$ tons. An experimental run with a train of sixteen 40-ton waggons was

made between Blaydon and Workington in April, 1903. Openings were found for the first 15- and 20-ton waggons between the large group of collieries in the neighbourhood of Stella Gill and the shipping staiths at Tyne Dock and for the 32- and 40-ton waggons between the Ashington group of collieries in Northumberland and the staiths at North Blyth. Experience revealed difficulties in the way of adopting the 32- and the 40-ton mineral waggons for general use, and only 13 of the former and 100 of the latter were constructed. In 1903 it was decided to adopt the 20-ton type as the standard high-capacity mineral waggon. The advantages of a waggon of



DOUBLE-HOPPERED 40-TON COAL WAGGON, 1903.

this capacity as compared with the $10\frac{1}{2}$ -ton mineral waggon may be summarised as follows:—

- (1) The freight load in relation to tare is 16 per cent. greater.
- (2) The gross load of the train is increased by 15 per cent.
- (3) The freight or revenue load of the train is increased by 34 per cent.
- (4) The length of siding required for standing an equivalent tonnage of coal is 20 per cent. less.
- (5) A given tonnage can be moved with the same type of engine in 25 per cent. less train miles when consigned in the larger waggons.

The type of covered goods waggon of high capacity which the Company at first adopted was that of 15 tons with four wheels and two doors at each side. A smaller waggon, 20 feet in length, with a carrying capacity of 12 tons, was afterwards found more suited to their traffic, and this type was substituted for the other as the standard high-capacity goods waggon.

Another change about to be made on the ground alike of economy and efficiency was the substitution at certain busy parts of the line of power and automatic signalling for the ordinary mechanism of working signals and points, the first installation being that of the Westinghouse electro-pneumatic system at Tyne Dock, the second that of the "Hall" electric automatic system on the main line between Alne and Thirsk junction.

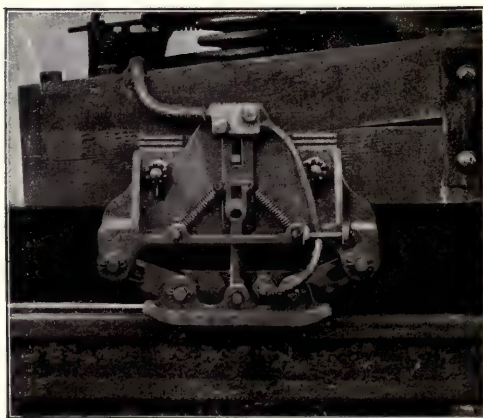


SPECIAL TRAIN WHICH OPENED THE FIRST ELECTRIC TRAIN SERVICE ON THE
NORTH EASTERN RAILWAY, MARCH 29TH, 1904.

As to the second problem—the competition of electric trams in the Newcastle district—it was during the autumn of 1902 that the Tyneside Tramways were opened from Gosforth to North Shields, taking away a good deal of short-distance traffic from the railway. The effect was shown in the accounts—a falling off in the passenger receipts of £30,000 for the half-year, one-third of which was certainly due to tramway competition. During this period the Company had carried 18,000 fewer first-class and four million fewer third-class passengers than in 1901, though every other branch of traffic showed a substantial increase.

It was therefore decided to equip 37 miles of railway for electric traction. Early in 1903, contracts were let, one to the British Thompson-Houston and the other to the British Westinghouse Company. The work had, of necessity, to be carried out without interrupting the ordinary traffic, but by September 27th, 1903, the equipment of a portion of the riverside line was in a sufficiently advanced stage to admit of the experimental running of one of the new trains between Carville and Percy Main, a distance of three miles. On the 29th of March, 1904, the Company began working the section between New Bridge street, Newcastle, and Benton by electric power. The public service was preceded by a special train—the standard train of three coaches—light open vehicles of the corridor type, each 55 feet in length and 9 feet in width, carried on four-wheeled bogie trucks. It performed the journey of nearly five miles, including three stoppages at intermediate stations, in eleven minutes, a saving of four minutes on the steam train time, and returned in about eight minutes. At 12.50 p.m. the first train of the new service left New Bridge Street Station with more than its complement of 186 passengers.

On the 6th of June the service was extended to Monkseaton and during the race-week holidays to Tynemouth.



CURRENT-COLLECTING SHOE
(Lowered.)

By the end of the month the electrification of the older line to Tynemouth and the Riverside branch was completed, and on the 1st of July, the circuit between the Central and New Bridge Street Stations, Newcastle, *via* Tynemouth, was opened throughout for electric working. On the 25th of July, having electrified a portion of the main line from Heaton to Benton and connected it by means of a curve at Benton with the Newcastle and Monkseaton (B. and T.) line, the Company supplemented the ordinary electric service

between Newcastle and Tynemouth by a number of express trains, five in each direction. The route was an epitome of the growth of the railway system, "line upon line," having been formed by five different companies and opened for traffic at such different times as 1839, 1847, 1850,

1864, 1882 and 1904. The date was the ninetieth anniversary of the trial run of Stephenson's first locomotive engine on the Killingworth waggonway which the electric trains crossed near Benton Square. Remembering the important results of this experiment and the state of efficiency to which the locomotive engine was carried in Stephenson's day, it is interesting to learn that, only a year before his death, the famous engineer had some prevision of electric traction, for, to a young manufacturer in Newcastle, Mr. G. C. Warden, he expressed the opinion that probably within the lifetime of the latter, "electricity would be the great motive-power of the world."*

As to the third problem—the reorganisation of the traffic department—the changes involved were so far-reaching that it was considered advisable for a party of the principal officials of the North Eastern Railway to visit the United States in order to study American methods of moving and handling traffic. During the course of a tour of thirty-one days the party travelled upwards of 4,500 miles over the principal railway systems of the United States. What they saw of the working of these lines fully confirmed the reports which had reached them of the success of the American railway management and encouraged them to proceed with the reform of their own railway practice in the direction of increasing train loads and decreasing train mileage. As the ordinary statistics of the North Eastern Railway, which Sir Lowthian Bell had introduced in the seventies, and for many years compiled with his own hand, elaborate as these were, did not give the average train load or the average length of haul, it was decided to arrange for the compilation of passenger-mile and ton-mile statistics in order to obtain the data required. The utility of such statistics had been pointed out as long ago as 1874† and 1875‡ and exemplified on the Indian railways for over thirty years, but this was the first time that an English railway company had come to a decision to compile them.

Sir George S. Gibb, who was then the general manager of the North Eastern Railway, became and throughout his railway career remained, a strong advocate for these statistics, and was never tired of explaining to the uninitiated or the prejudiced both what such statistics can do and what they cannot. "Their main use," he explained, "is practical, not theoretical. They do not enable persons bent on pursuing some unsound

* *Times*, April 12th, 1904. Letter on "George Stephenson and Electricity," by G. C. W.

† *Economist*, Nov. 7, 1874.

‡ *Proc. of Inst. of Civ. Engineers*, Feb. 23, 1875.

theory of railway rates to establish economic heresies. But they do enable a railway manager to test the work done in carrying passengers and merchandise on any part of the railway, to measure the work performed in relation to many important items of cost incurred in performing it, to compare period with period and district with district, to supervise local staff with a full knowledge of results, to control train mileage, and to enforce economy in working."



EAST END OF CENTRAL STATION, NEWCASTLE.

(showing Electric and Steam Trains).

The first ton and passenger mile figures taken out by the North Eastern Company—for the month of May, 1900, as to goods and minerals, and for the month of October, 1900, as to passengers—yielded, in conjunction with the train mile and other figures possessed by the Company, the following information, viz.: that the average train load of merchandise and live stock was 44·18 tons and of minerals, 92·49 tons*; that the average haul of goods and minerals was 22·23 miles; that the average rate per ton mile for mineral

traffic was '99d. and for goods traffic 1·642d.; that the earnings from merchandise and mineral traffic per train mile averaged 82·65d.; that the number of passengers per train was only 62·10; that the average distance travelled by them was 13·87 miles; that the earnings per passenger per mile averaged '617d., the earnings from passengers per train mile 38·54d., and the receipts of passenger trains per mile 45·96d.† In the light of the facts revealed by these figures, the management proceeded with the introduction of the new methods of working.

Early in January, 1902, the final arrangements were made for the reorganisation of the traffic department on the principle of separating the work of moving and handling traffic from that of procuring and charging for it. What was called in American phraseology the "operating" branch of the department was placed by the new scheme under the control of a general superintendent assisted by three divisional superintendents and nine district superintendents while the "commercial" branch was placed under the control of a chief goods manager, assisted by five district goods managers and a chief passenger agent assisted by two district passenger agents. Over both branches of the department was placed the chief traffic manager who, in turn, was responsible to the general manager. The main idea of the scheme of reorganisation was that every operation connected with the working and handling of traffic should be under one control, the loading of waggons no less than the running of trains. In the redistribution of duties the goods department was therefore relieved of the charge of its stations, warehouses, terminal yards and docks and of the work of loading, unloading and handling traffic, the whole of this work being transferred to the general superintendent, upon whom rested the responsibility of carrying out the new methods of economical management. Some new posts were created—those of the divisional superintendents whose function it was to supervise the work of the district superintendents, and those of the "yard-masters," a new class of minor officials placed in charge of the marshalling sidings at the busy centres of the system. The office of mineral manager at Newcastle was merged in that of divisional superintendent of the Northern division (mineral section) to whom were allotted the commercial duties

* As the mileage of mineral trains includes the mileage of empty returning trains as well as of full trains, the average train load comes out as 92·49 tons. Excluding the mileage of the empty trains the average train load would have been double that given, or 184·98 tons.

† A table showing the increase in the average train load and in the average receipts per train mile from 1900 to 1912 inclusive, appears as appendix F.

previously performed by the mineral manager as well as the supervision of the working of the mineral traffic in the Darlington, Hartlepool, Newcastle, and Sunderland superintendents' districts. This reorganisation of the traffic departments was followed by changes in the administration of the locomotive department, the head of which now took the title of chief mechanical engineer. The changes were all in the direction of a devolution of responsibility which was distributed among three new district locomotive superintendents (charged with the efficient working of the engines), three new waggon superintendents and three new locomotive accountants. The reorganisation took effect on and from the 1st of March, 1902.

THE EAST COAST ROUTE.

Together with the North British, Great Northern, and Midland Companies the North Eastern had assisted in promoting a Company for the purpose of erecting a bridge across the Firth of Forth, guaranteeing to the shareholders on certain conditions a dividend of 6 per cent. Their object was to secure a fair share of the North of Scotland traffic, almost monopolised at this time by the West Coast Companies. Since the laying of the foundation stone of the middle pier on the Island of Inchgarvie on the 30th of September, 1878, little had been done, but the contractors, Messrs. William Arrol & Company, were making active preparations to begin the works at Inverkeithing and South Queensferry when the collapse of the Tay Bridge took place. Public confidence was shaken in the design of Sir Thomas Bouch—for a suspension bridge with towers of unprecedented height and spans of the enormous width of 1,600 feet. Grave doubts were entertained whether sufficient allowance had been made for wind pressure on the towers and chains and it was decided in the first place to refer the plans back to the committee of engineers who had reported that the bridge would be amply sufficient to “meet the strains due to extreme gales of wind.” These precautionary measures did not prevent the contractors from cutting the first turf at South Queensferry—a ceremony which took place on the 1st of March, 1880. The shadow of the Tay Bridge disaster, however, hung over the proceedings and the conviction was gaining ground that Sir Thomas Bouch's magnificent design would never be realised. Seven years had elapsed since its adoption, and now when the contract was let and the steel for the structure ordered, the Forth Bridge Company found it necessary to re-open questions affecting its very principles. The financial and engineering difficulties appeared to them so serious that in the next session, 1880, they

introduced a Bill for the abandonment of their undertaking, but this Bill the North Eastern in conjunction with the Great Northern and Midland Companies found it necessary to oppose. Their engineers considered that a continuous steel girder bridge on the cantilever principle as designed by Mr. John Fowler was quite practicable, and, before the Bill came up in the House of Lords, a conference took place at York between the representatives of the four railway companies chiefly interested in the scheme and those of the Forth Bridge Company, with the result that they agreed to withdraw the Bill and to apply for a renewal of their powers. The terms of arrangement were that the Forth Bridge Company should have an absolute and perpetual guarantee of 4 per cent. per annum instead of a conditional guarantee of 6 per cent., the four companies being liable in the following proportions—North British, 30 per cent.; Midland, $32\frac{1}{2}$ per cent.; Great Northern and North Eastern, $18\frac{3}{4}$ per cent. each.

On the 4th of March, 1890, the bridge was formally opened by the Prince of Wales. A mile and a half in length and 451 feet in height from the base of the deepest piers to the top of the cantilevers, with two spans of 1,710 feet, two of 675 feet, fifteen of 168 feet and five of 25 feet each, this gigantic structure, composed of nearly 60,000 tons of steel and iron, 740,000 cubic feet of granite and 330,000 cubic feet of rubble masonry and concrete, was the most remarkable engineering work in the world. The new route opened by the Forth Bridge gave the East Coast Companies an advantage over their West Coast competitors to Aberdeen and Inverness of nearly $16\frac{1}{2}$ miles.

RAILWAY RACES.

Up to this time, active competition between the East and West Coast Companies had been confined to the southern side of the Firth of Forth. One of the railway sensations of 1888 was the race to Edinburgh, when the West Coast Companies, on the 1st of June, began to run their principal day trains between London and Edinburgh in 9 instead of 10 hours. The East Coast Companies, whose corresponding trains had performed the journey since 1876 in 9 hours, replied by reducing their booked time to $8\frac{1}{2}$. Towards the end of July the West Coast announced that they also would run in $8\frac{1}{2}$ hours from the 1st of August, and the East Coast therefore made arrangements to run in 8 hours on the same date. The West Coast then announced a further reduction to 8 hours to begin on the 6th, on which date their train arrived at Edinburgh eight minutes before time; but it consisted of four carriages only, weighing about 80 tons, while the weight of the East Coast train was not less than 100 tons.

On the 13th of August the East Coast reduced their booked time to $7\frac{3}{4}$ hours, and on the same day the West Coast accomplished the journey in 7 hours 38 minutes. The following day, the East Coast cut down their record to 7 hours 32 minutes, the run from Newcastle to Edinburgh (124½ miles) being performed in 124 minutes. A conference was held on this day, when it was arranged that the booked times until the end of the month should be fixed at $7\frac{3}{4}$ hours for the East Coast and 8 hours for the West Coast. On the last day of August the East Coast drivers, by way of a fitting finale to the remarkable series of runs, made a special effort to outdo all their previous performances and establish a record for the East Coast route. The journey from London to York (188 miles) was performed in 3 hours 22½ minutes, and from York to Edinburgh (204¾ miles) in 3 hours 37¾ minutes, at an average speed, deducting stoppages, of 57·6 miles per hour for the first part of the journey, and 57·7 miles per hour for the second. Between York and Newcastle, the train, which consisted of two first-class, two composite, a third-class carriage and two vans—a total weight of 100½ tons—was hauled by one of “Tennant’s express passenger engines,” built in 1885, and from Newcastle to Edinburgh by one of Mr. T. W. Worsdell’s compound engines built in 1887.*

After the Forth Bridge was opened, competition between the rival routes was extended to the North of Scotland, and became more and more active. Every year since 1890, improvements had been made in the East Coast service, and the determined efforts of the West Coast Companies to minimise the advantages obtained by their rivals made the great race of 1895 one of the most interesting chapters in railway history. Each stage of the contest was followed by the public with intense interest, and people who had not the remotest idea of ever visiting Aberdeen rejoiced none the less when the journey-time (by the route they favoured) was reduced first by minutes and then by hours. Alarmists prophesied grave disaster, while optimists proved—in letters to the press—that trains travelling at high speeds were much the safest. Fortunately the forebodings of the fainthearted had no realization, and the racing ended without mishap.

* Mr. Edward Fletcher retired in 1882. He was succeeded by Mr. Archibald Macdonnell, who resigned in 1884. Between his resignation and the appointment of Mr. Thomas William Worsdell in 1885 the North Eastern Railway was without a locomotive superintendent. Some heavier engines being required to work the East Coast express trains between Newcastle and Edinburgh, Mr. Tennant suggested the building of a class of engines similar in type to those of class 901, but with a longer wheel base and larger cylinders. A design was submitted which received the approval of the locomotive committee, and in February, 1885, the first of a set of twenty engines, officially known as the 1463 class, was ready for work.

When Dr. Johnson visited Aberdeen in 1773, on his way to the Hebrides, the city was very little known to the travelling public, and he did not think it "superfluous to relate that, under the name of Aberdeen are comprised two towns about a mile distant from each other." The journey from Edinburgh to Aberdeen was made leisurely in a post-chaise which, to Dr. Johnson, represented "the luxury of travelling." The line into Aberdeen was opened in 1850, but it was not until 1855 that a through service with through bookings by the East Coast lines was brought into operation. The North British rails then ended at Edinburgh and the Caledonian line did not extend much further north than Greenhill, the junction with the Scottish Central. By either route Aberdeen was only reached by passing over the lines of independent companies, and it was not until the Forth Bridge was brought into use, in 1890, that the East Coast route secured a marked advantage.

The journey between London and Aberdeen, which in 1855 had taken about $17\frac{1}{2}$ hours, had, by 1887, been reduced to 14 hours. In 1888, the "race to Edinburgh" had led to an understanding between the rival companies that the time taken by their best trains from London to Edinburgh should not be less than $8\frac{1}{2}$ hours. This arrangement, while leaving the West Coast Companies free to accelerate their trains to more northerly places, like Perth and Aberdeen, acted as a restraint on the East Coast, whose route to these cities was by way of Edinburgh. In 1889, therefore, we find the journey from Euston to Aberdeen reduced to 12 hours 50 minutes, while the trains from King's Cross were timed to take a full half-hour longer.

In 1894 the shortening of their route by the construction of the Forth Bridge and an acceleration of the North British trains north of Edinburgh made it possible for the East Coast Companies (while still observing the "understanding") to reduce the journey to Aberdeen to 11 hours 35 minutes; the West Coast trains, under revised timings, took about 15 minutes longer.

So things remained until 1895, when the West Coast, on June 22nd, announced that, commencing on July 1st, their 8.0 p.m. from Euston would be booked to reach Aberdeen at 7.40 a.m.—just 5 minutes behind the East Coast train. The East Coast now threw over the $8\frac{1}{2}$ hours agreement, maintaining that the "informal understanding" had not been intended to apply to the night trains, but only to the day trains, which had a 20 minutes luncheon stop at York. They announced that from July 1st there would be an acceleration of their 8.0 p.m. train from King's Cross to allow of Aberdeen being reached 15 minutes earlier than before. For a fortnight the booked

services by both routes remained unchanged, the East Coast trains reaching Aberdeen 15 minutes, or, by virtue of better time-keeping, as much as 30 minutes, ahead of their rivals. But these small re-arrangements proved to be merely a preliminary skirmish. The challenge was thrown down by the London and North Western and Caledonian Companies on July 15th, when, by huge blue posters, they announced that "from that very night" their train from Euston would be timed to reach Aberdeen in 11 hours—a 40 minutes acceleration on their previous timings. It could not be expected that the East Coast Companies, having spent so much capital on the Forth Bridge, would surrender their position without a struggle. Railway enthusiasts, in the words of one of them, "snuffed the battle from afar," and began to consider possibilities. The two routes were compared. The East Coast route was the shorter by a trifle over 16 miles, but there were other factors to take into account—gradients, curves, stops, portions of line where slowing-down was necessary. In the matter of gradients, the West Coast route with steep banks at Shap and Beattock was probably the more heavily handicapped; but, on the other hand, the East Coast route was at some disadvantage in having two "frontier" stops (York and Edinburgh) while the rival route had only one (Carlisle). In addition to the halt (common to both trains) at Aberdeen Ticket Platform their trains were timed to stop at four other stations, Grantham, Newcastle, Dundee, and Arbroath, the corresponding stops on the competing line being Crewe, Stirling, Perth, and Forfar. Later—August 19th to 21st—one intermediate stop on each route was eliminated, viz., Arbroath on the East Coast and Forfar on the West Coast, and, on what came to be called the "exhibition" run of August 22nd, the West Coast eliminated the stop at Stirling. The East Coast had also the disadvantage of a stretch of single line on the North British section of their route, in passing over which their trains were obliged to slow-down five times for exchange of tablets. The West Coast trains, it is to be remembered, were on the whole very much lighter than those of the East Coast.

The two routes joined at Kinnaber Junction, 38 miles south of Aberdeen, between which points the East Coast trains had to pass over the Caledonian line by virtue of running powers granted in 1866. The "finishing post" then was virtually Kinnaber. Whichever train got precedence there held the road and was bound to reach the ultimate goal first. It was probably this fact that so stirred the public imagination. Two trains leaving London at the same hour (8.0 p.m.), one from King's Cross and the other from

Euston, sped by widely different routes to a common point, and completed their journeys by travelling over the same pair of rails. From section to section along their respective lines the trains would be signalled until at Kinnaber the block-working bells for both were to be found in the same cabin. On one occasion the two bells announcing the approach of the rival trains are said to have sounded together. The race of 1888 had been devoid of such dramatic possibilities, for in Edinburgh the Caledonian and North British Companies had different stations.

The East Coast Companies did not take up the challenge of July 15th quite so quickly as the more impetuous of their supporters hoped, while the West Coast trains were run before advertised time; so that on the morning of July 17th they reached Aberdeen in 10 hours 21 minutes, a feat which caused a considerable sensation at the time.

The East Coast reply came on the 22nd, and, in the circumstances, was a moderate one. They proposed merely to quicken their train by 35 minutes, so that it would be booked to reach Aberdeen at 6.45 a.m., 15 minutes before the booked time of the West Coast. Hitherto their trains had not been, and, indeed, until the last two days of the race were not, allowed to leave intermediate points before booked times, while their rivals observed no such precision. They could scarcely expect, therefore, that their new timings would bring their trains into Aberdeen first. The West Coast were not content with the mere possibility of arriving first, however, and at once altered their advertised arrival time to 6.40, and, on the East Coast making theirs 6.25 a.m., they altered the time again on July 29th to 6.20 a.m. For a while the West Coast had it all their own way. Their trains continued to run before time, and on one occasion the distance was covered in a minute under the 10 hours. It was not until August 18th that an East Coast train again got in front at Kinnaber.

On August 19th the scheduled times by both routes were once more reduced, and the changes then made were the most startling of all, the East Coast proposing to bring their train in at 5.40 a.m. (9 hours 40 minutes), and the West Coast by 5.35 a.m. (9 hours 35 minutes).

On the first day of the new timings the East Coast train spent 16½ minutes at the several stopping-places waiting for time, and, although it reached Aberdeen at 5.31 a.m.—9 minutes ahead of schedule—it was found that the West Coast train had arrived some 16 minutes before it. Once more the East Coast Companies realised that victory does not always lie with the unduly punctilious, and on the morning of August 20th their men turned out prepared to do their best unhampered by published schedules. Their com-

petitors, however, beat them at Kinnaber by a minute, and steaming into Aberdeen at 4:58 showed—that had never been shown before—that a journey of 540 miles might be covered in 538 minutes.

The East Coast train's performance had been only a degree less noteworthy, and the following trip was to prove what it was capable of doing. Leaving King's Cross at 8 p.m., the racer kept up a 60-miles-an-hour pace up the steepest gradients (such as Potters Bar and Stoke) and Grantham, 105·3 miles, was reached in 101 minutes. After a 4-minute pause the second stage—Grantham to York—was accomplished in even finer style,



ENGINE No. 1620,

Which made the record run in the Railway Race of 1895.

the 82·7 miles being covered in 76 minutes. York to Newcastle (80·5 miles) took only 79 minutes, but from Newcastle to Edinburgh the most noteworthy running of the whole race was made, the distance of 124½ miles being covered in 113 minutes—a speed of over 66 miles per hour. From Edinburgh the North British Company carried the train forward, and Aberdeen was reached at the unprecedented hour of 4:40 a.m. (523½ miles in 520 minutes) a speed per hour of 60·4 miles per hour or of 61·8 deducting time for stoppages.

This ended the racing, the East Coast Companies saying in effect that they had done enough for honour, and had other matters to attend to. On

August 22nd the West Coast gave an exhibition run, leaving out the stop at Stirling, and made a new world-record, for they managed (but with a train of only 65 tons) to cover the 540 miles to Aberdeen in 512 minutes. The East Coast Companies showed no inclination to emulate this remarkable performance, and what they are capable of doing at equal weights is still undecided.

In September several improvements were made in the Scotch service and the effects of the race were also traceable in the time-tables of the Great North of Scotland and Highland Railways, changes being made which improved the connection with Braemar by three-quarters of an hour, with Peterhead by 2 hours 10 minutes, with Elgin by $1\frac{1}{2}$ hours, and with Inverness by $1\frac{3}{4}$ hours.

At this time (1895) there were differences between the North British Company and their partners in the East Coast route (the Great Northern and North Eastern Companies) with reference to the exercise of the running powers between Berwick and Edinburgh granted to the North Eastern Company in 1862.

Since the 1st of June, 1869, the North Eastern Company had worked East Coast trains between Berwick and Edinburgh with their engines, and manned them with their drivers and guards in accordance with an arrangement made in 1869, under which the North British Company took the receipts and paid the North Eastern a fixed sum per mile.

In 1894, the North British Company, having decided to reconstruct their Waverley Station, and desiring to obtain the entire control of the traffic on their line, filed an application to the Railway and Canal Commission in England for an order enjoining the North Eastern Company to receive from them at Berwick East Coast trains coming south, and also to hand over to them at Berwick East Coast trains going north. The Commissioners intimated that, as the application of the North British Company involved the prevention or restriction of the exercise by the North Eastern Company of running powers, it was impossible for the Court to make any part of the order asked for until the rights of the North Eastern Company under the agreement of 1862 had been ascertained by some competent tribunal. To obtain a definition of these rights the North British Company, therefore, commenced legal proceedings in the Scottish Courts.

The proceedings continued until the beginning of 1898, the claims of the two companies being successively heard by the Court of Session (Scotland), the House of Lords and the Railway and Canal Commission (Scotland).

In February, 1898, the Railway and Canal Commission (Scotland) issued an order to the effect that the North Eastern should engine ten trains per day and the North British eight. This arrangement continued until 1904 when the two companies entered into an agreement under which the North Eastern have since worked the whole of the through trains running between Berwick and Edinburgh, subject to the payment by the North British Company of a fixed sum per train.



SCOTCH EXPRESS PASSING OVER WATER-TROUGHS NEAR BELFORD.
(Engine No. 2029, Class R.)

One result of the dispute with the North British Company was the running of through carriages twice a day between Newcastle and Glasgow *via* Carlisle by arrangement with the Caledonian Company, that route being some miles shorter than the route *via* Edinburgh, viz., 162½ miles, as against 171 miles.

It is interesting to note that the North Eastern brought into use on the 1st of March, 1898, the first pick-up water troughs on their system, between Luckier and Belford, in connection with the East Coast trains not timed to stop at Berwick. At Danby Wiske near Northallerton a second set of troughs was laid down about three years later.

For working the express passenger traffic of the North Eastern Railway two new types of locomotive engines had been designed in 1899. Owing to the greatly increased tractive power of the four-coupled and six-coupled bogie engines the Company were able to run trains of 250 and 300 tons to time without the aid of any pilot engine. How much reserve power the new engines possessed was shown during another so-called "Race to Edinburgh" in July, 1901, when the Midland Company and their allies made some marked accelerations in their service and put on from the 1st of July a new train timed to leave St. Pancras at 9.36 a.m. and to arrive at Edinburgh at 6.5 p.m., *i.e.*, ten minutes before the booked time of arrival of the "Flying Scotsman," as the 10 a.m. train from King's Cross had long been called. As the "Flying Scotsman" and the Midland train were timed to arrive so near together at Portobello Junction, it was obvious that the former would not infrequently be blocked by the signals which cleared the road for the latter. The North Eastern therefore determined to run the "Scotsman" into Edinburgh ahead of the St. Pancras train. They succeeded in doing so, bringing the East Coast train into the Waverley Station before its scheduled time, while the Midland train, during the same period, was from one to sixteen minutes late in reaching Edinburgh. After a week the West Coast Companies (L. & N.W. and Cal.) deemed it necessary to give some indication of what they could do in the way of acceleration and their train reached Princes Street station thirty-five minutes before time. The next day they brought it in seventeen minutes before time, but as the North Eastern did not take up the challenge they resumed their normal working.

LABOUR QUESTIONS.

With an army of employees of all grades numbering (in 1880) over thirty thousand, it could hardly be supposed that the North Eastern remained entirely unaffected by the general demands of labour for improved conditions. In 1888 there was a sectional disturbance in the neighbourhood of Darlington and in the latter part of 1889 there was a general agitation among the Company's servants for shorter hours of labour, their demands being embodied in what was known as the "Darlington programme," the principal points of which were: (1) Ten hours to constitute a day; (2) overtime to be paid for at the rate of time and a quarter and Sunday duty time and a half; (3) no man to be called out under a day's pay. The men's leaders—all of them members of the Amalgamated Society of Railway Servants—asked for an interview with the directors for the purpose of discussing the programme. As a result

of the interview certain concessions were made, but these did not put an end to the agitation. A critical stage was reached on the 6th of December, when the men employed in the goods stations at Newcastle and Gateshead handed in their notices with the object of enforcing a demand for a nine-hours' day and overtime at the rate of time and a quarter. The Company offered to refer the matters in dispute to arbitration and to this proposal the men, as required by the rules of their own Association, agreed. At the request of the Company, the Amalgamated Society of Railway Servants and the National Labour Union, (whose claim to represent the men appears on this occasion to have been allowed), Dr. Spence Watson consented to act as arbitrator. His award, delivered on the 10th of January, 1890, made no change in the hours worked by the rolleymen, vanmen, loftmen, fodder-choppers, and stablemen, but gave a nine-hours' day to the porters, checkers, capstan-men, traversers, chockers, and grain warehousemen employed at Newcastle and Gateshead. This was the first time in the history of the North Eastern Railway that a labour dispute had been referred to arbitration, and no little satisfaction was expressed by the men's leaders at having secured the recognition of this mode of settlement, though a manifesto was shortly afterwards issued by the Amalgamated Society pointing out that no part of the programme had been conceded and asking for a further mandate.

During 1890 the spirit of unrest spread to other parts of the United Kingdom. The Darlington programme which originated with the North Eastern men developed into a movement for shorter hours among railway men generally. Strikes were everywhere threatened. The demands for shorter hours were accompanied by a claim on the part of the Trade Union officials to act as the representatives of the men in their negotiations with their employers. The refusal of some of the larger Scottish Companies to admit this claim was one of the principal barriers to a peaceful settlement on the other side of the Border. The North Eastern Company were willing to meet a committee of the men, either alone or associated with any persons whom they might select to accompany them in the capacity of advisers with a view to discuss, and if possible to settle, the questions raised and passed a formal resolution to this effect. Shortly afterwards—on the 20th of December 1890—Mr. Tennant met a deputation of the men at Newcastle, who were accompanied, as arranged, by Mr. Harford, the general secretary of the Amalgamated Society. The various points in dispute were settled between Mr. Tennant and Mr. Harford, some against and others in favour of the men. The concessions by the Company included: an eight-hours' day for shunters

at busy yards, a week of six days instead of seven for the passenger staff, men on duty on Sundays receiving pay in accordance with a specified scale, and an advance in wages to platelayers.

By thus waiving their objections to treat with outsiders, the Directors averted a strike, and the North of England escaped interruptions to trade and commerce and possibly the disturbances and riotous proceedings which characterised the strike of the railway men in Scotland. This agitation for shorter hours and higher wages coincided with the return of prosperity to the North of England, the ground on which the demands were made being, in fact, the improved circumstances of the Company. In 1889 the gross receipts were nearly the same as those of 1883 and in 1890 for the first time in the history of the Company they exceeded seven millions. For the first time, too, the working expenses rose above four millions.

During 1892 the trade of the district served by the North Eastern Company was disorganised by a series of strikes—fortunately not of their own men—which practically suspended ordinary business and wrought incalculable harm. First, there was the strike of the engineers on the Tyne and the Wear which lasted thirteen weeks and threw 23,000 men out of employment; the dispute arose not between the men and the masters but between one section of workmen and another, the question at issue being: whether a pipe of a certain diameter should be fixed by the fitters or the plumbers. Then there was a strike of the South Yorkshire coal-miners, which was fortunately settled in a week, and finally there was the disastrous strike of the Durham coal-miners who stood out for twelve weeks against a reduction in wages, all the collieries in the county being closed, most of the blast-furnaces damped down, and numerous works stopped. In March and April there were probably not less than 130,000 men totally idle as a result of the strikes between the Tyne and the Tees. The strike began on the 14th of March, and on the 15th the North Eastern Company withdrew no fewer than 178 of their passenger trains. Their mineral lines were almost deserted. Tyne Dock was at a standstill the greater part of the time. At all the north-eastern ports was to be seen the melancholy spectacle of steamers laid up for want of cargoes. How the strike affected the North Eastern Railway is shown by the enormous decrease in the quantity of coal and coke and other minerals carried during the half-year—a decrease of nearly five million tons. In revenue the Company suffered to the extent of nearly half a million pounds: the result was a drop in the rate of dividend for the half year from 6 per cent. in 1891 to 3 per cent. in 1892.



MIDDLESBROUGH DOCK AS ENLARGED.

At the beginning of 1897 a general condition of unrest prevailed in the railway world (following, as before, upon a general improvement in trade), which had its origin in the resolutions of a meeting of the Amalgamated Society known as the Birmingham Conference. Several concessions were made by the North Eastern Company, including an extension of the eight hours' day for shunters and a reduction of the hours of signalmen from ten to eight in some cases and from twelve to ten in others. Unfortunately, however, an offer of revised terms of employment, involving the abolition of overtime pay aroused jealousy and resentment, and on the 20th February various



ELECTRIC TRAIN OF NINE CARS,
With view of Guarded "Live" Rails.

grades of men struck. In leaving their work without notice the men not only broke their engagements with the Company, but infringed the rules of their own Society. The Company declined to enter upon the discussion of any matter with the men whilst they remained on strike. Mr. Harford, the general secretary of the Amalgamated Society, recognised that a blunder had been made and recommended the men to put themselves right by returning to work; but having taken the law into their own hands, they were very unwilling at first to go back to constitutional methods. In the course of a few days Mr. Harford's authority made itself felt, and the strike was settled on terms arranged between Mr. Gibb, who had succeeded Mr. Tennant as General

Manager, on the one hand and Mr. Harford and a deputation from the men on the other. In accordance with these terms the men resumed work on the 1st of March, and on the 12th a conference took place between the directors and a deputation from the various grades on the question of the programmes.

In view of the fact that the North Eastern is the only one of the railway companies which admits the principle of "recognition," the evidence of Mr. A. Kaye Butterworth, the General Manager, before the Commission on the Conciliation Scheme of 1907 is of especial interest in relation to the question. The following is a résumé of that part of it dealing with the origin of "collective bargaining."

"The principle of collective bargaining, *i.e.*, recognition of trade unions, goes back to very early days; in fact I find that there was a case as far back as 1849, when there was a dispute on the York, Newcastle, and Berwick Railway (which is now part of the main line) with their engine drivers. There the drivers had a meeting with the directors, and after some discussion of terms the men requested that a certain Mr. Marshall should be allowed to appear on their behalf. He was described as a man from Birmingham who dealt with these sort of matters. He was evidently an expert in trade disputes and the men asked whether he might come and take part in the negotiations and discussions on their behalf. No objection was raised. Again in 1874 there was a dispute with the trimmers and teemers—the men engaged in putting the shipment coal into ships. In that case, first of all, there was correspondence with a local trade union representative, and later on the matter was taken up by a Mr. Hudspith, who appears to have been the official head, probably the secretary, of the Durham Trimmers' and Teemers' United Association. Coming down to recent times the next incident that throws any light on the North Eastern practice occurred in 1888. Mr. Walter Hudson, M.P., was then in the North Eastern Company's service, and he was also secretary of the Darlington branch of the Amalgamated Society of Railway Servants. The men, or a certain section of them, had then a programme of improved conditions of service, which was sent forward to the company. That was submitted by a deputation of the men accompanied by Mr. Hudson. Of course, there Mr. Hudson was in the Company's service, and, therefore, this case was somewhat different from the others; but he appears to have been acting as a secretary of the trade union, as he conducted the correspondence with the Company's secretary and arranged meetings with the directors.

“ In 1889 there was a dispute with certain grades at Newcastle and Gateshead. That dispute was the first case referred to arbitration on the North Eastern. It was referred to Dr. Spence Watson. His award recites that he had been requested to undertake the reference by representatives of the Railway Company, of the Amalgamated Society of Railway Servants, and of the National Labour Union, and that at the arbitration all those parties had been represented before him.

“ In the next year, 1890, a programme for improved conditions, also in the Tyneside area was sent forward, signed by the general secretaries of the Amalgamated Society of Railway Servants, the General Railway Workers' Union, and the Tyneside and National Labour Union. In that case a strike was threatened, and a meeting was arranged ultimately between the directors and the men, who were accompanied by the three general secretaries. The following minute was passed by the directors, which really might be said to constitute the formal recognition on the part of the Company of the claim of men, or a section of the men, to have a trade union official outside the Company's service, accompanying their deputation. ‘ The directors have considered at their board meeting to-day the letter of Mr. Harford, the secretary of the Amalgamated Society, dated 15th December, addressed to the general manager of the Company and delivered at his office on Monday last. The directors do not see their way to depart from the position which they (in common with the directors of other railway companies) have hitherto maintained, that any discussion as to the terms of service of the servants of the railway company must take place directly between the servants of the Company on the one side, and the heads of different departments, the general manager, or the directors themselves, as the case may be, on the other. The directors desire the men in the service of the Company to know that, as regards signalmen, the general manager, under the instructions of the board, has had under his consideration for a few weeks some revision of the terms of service, especially in regard to payment for Sunday duty. As regards all classes of men, the board are willing, either by a committee of themselves or through the general manager, in concert with the heads of departments, to meet any committee of the men, either alone or associated with any advisers whom they may select to accompany them, with a view to discuss, and if possible to settle, the questions which have been raised.’ It was evidently thought desirable to put on record the position of the Company in relation to the presence of outsiders at their discussions, and it took that form.

“ Apart from the minute of the directors with regard to the reference to Lord James in 1897, that is the only formal minute dealing with the question of the relations between the Company and trade unions. No question has been raised on the North Eastern since that time on that general subject; that is to say, if the men had a programme of demands to put forward and they wanted a trade union official to accompany them, the right of the men to ask for that has never been questioned. As regards the broad question of principle, the presence of a trade union official, not in the service of the company, attending a deputation on some large question has never been called in question since.

“ Speaking generally on the North Eastern, the attitude of the directors towards questions with the men has been rather to treat them as questions of management than as questions of direction. The actual meetings with directors have been very few, the meetings having generally been with the head officials.

“ In 1897 there was a dispute, and again it was at Newcastle. It arose with regard to an option which the Company had given to the checkers in their warehouse to be paid either an upstanding wage or a wage with overtime; some of the other grades resented this option being given to the checkers, and so it created trouble and a number of men came out on strike. Mr. Harford was then the general secretary of the Amalgamated Society and Mr. Richard Bell organising secretary, and they both came down to Newcastle and met Sir George Gibb, and after some little negotiation the strike was settled. It was a term of the settlement that there should be a further meeting to discuss how certain demands of the men should be met, and it was then agreed, immediately after the strike, to refer the men's demands to arbitration. At the time the strike was settled, an appointment was given for a meeting with the directors. It was decided to refer the programme, which was a wide programme for improved conditions of service, to an arbitrator. It was a very big question; the men's claims meant a very great improvement in the conditions of service, involving a very large sum of money. It was quite a new departure so far as the N.E.R. or any railway company was concerned, to refer questions of that sort to an outside authority.

“ In the minute the directors set out very fully their view of the situation. The directors, being unable to justify any concessions beyond those already made, have sought for some mode of meeting the difficulty, which would avoid a conflict between the Company and a considerable section of their men, They believe that, under the circumstances, the only solution is to be found



NORTH EASTERN RAILWAY BOARD-ROOM, YORK (NEW OFFICES), 1906.

in a reference to arbitration, and they have therefore decided to propose that the questions in regard to wages and hours shall be submitted to arbitration, subject to the following conditions and reservations:—(1) That the questions for arbitration shall be limited to those of wages and hours. The directors are not prepared to refer to arbitration any question affecting the discipline and control of the staff. (2) That the proposals of the locomotive staff, that eight hours should constitute a day's work, and that any time worked over eight hours be paid for at the rate of time-and-a-quarter, which proposals the directors must entirely reject, shall be excluded from the arbitration. (3) that the grades of men whose wages and hours may be submitted for determination shall be a matter for preliminary agreement. (4) That the arbitrator shall be agreed upon, or, in the case of failure to agree, shall be appointed by some judicial authority.

“ Lord James of Hereford was agreed upon, and it was not therefore necessary to apply to any one to make the appointment. Sir George Gibb and Mr. Richard Bell, were appointed arbitrators and Lord James was umpire. Sir George and Mr. Bell conducted the case before him, in the capacity of arbitrators of the advocate type.”

The next large deputation was in 1898 and 1899, composed of the locomotive men, whose chief claim had really been ruled out of the 1897 arbitration. There was a conference between the chief mechanical engineer and a deputation of the men accompanied by Mr. Richard Bell, and then a further conference at which the general manager was present, and at that conference an arrangement was come to which included several concessions to the locomotive men.

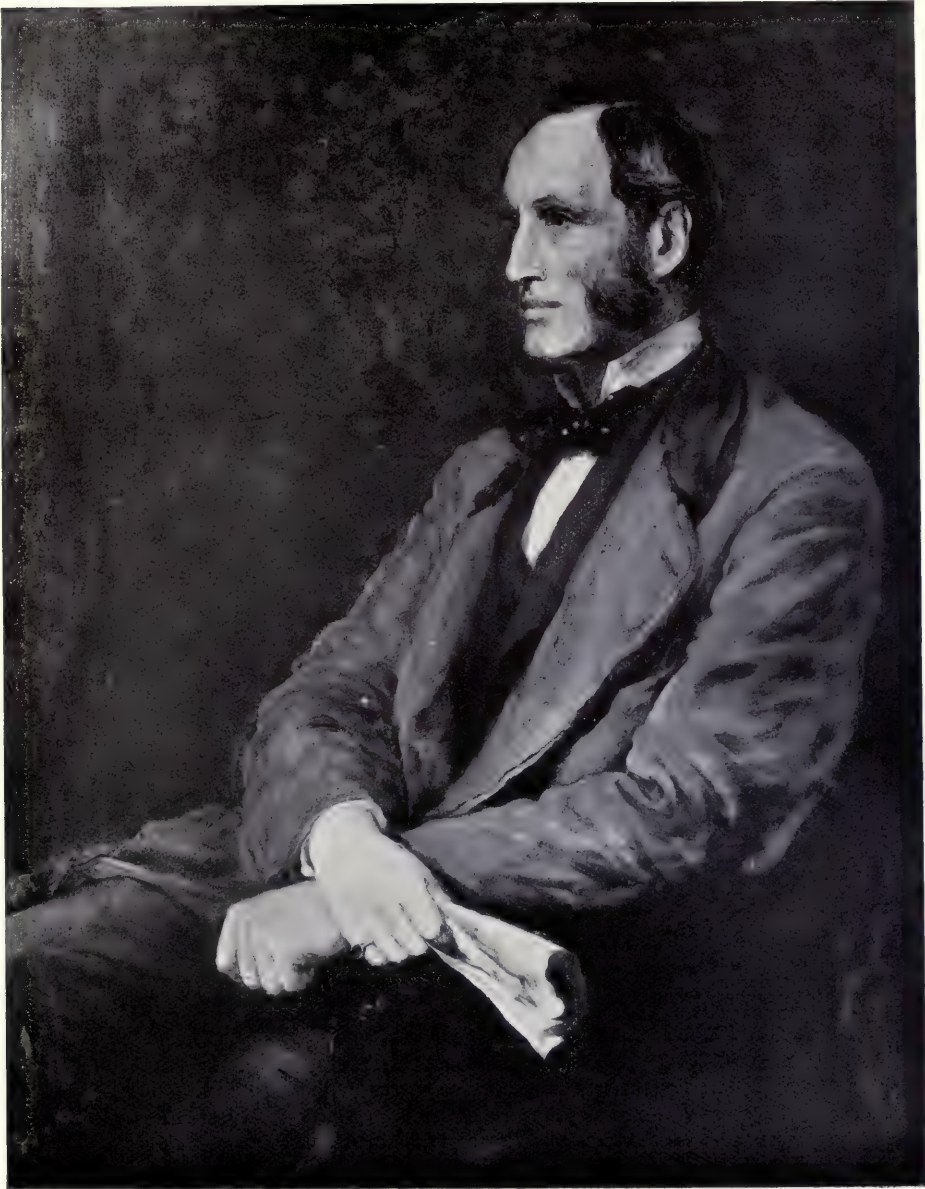
There was another conference of the same nature in 1899-1900, involving the detailed consideration of a great many matters. A settlement was come to, which was embodied in a minute of the conference. The terms of the agreement were set out in detail in four or five pages of printed matter, with a schedule showing what the demands had been. This document was signed by the officers and by the men who attended, with Mr. Richard Bell's name at the head of the men's representatives.

FINANCIAL PROGRESS.

Within their own borders the North Eastern Company had the satisfaction, in 1880, of seeing a rapid revival of trade. Their traffic returns showed at first an increase of £10,000 a week, then of £20,000, and, as the half-year advanced, of £30,000 and even £35,000 a week. Orders for pig iron were

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PLATE XXXVIII.



W. W. Outless, paint.

John Dent Dent—Chairman, 1880-1894.

To Mr.
Alfred A. O.

pouring into the district, and the great Eston works could scarcely keep pace with the demand for steel rails. Messrs. Bolekow, Vaughan and Company were completing arrangements for the application of the Thomas-Gilchrist process on a scale which would enable them to turn out about 1,500 tons of Cleveland steel rails per week, and Bessemer converters were being erected at the Albert Hill works, Darlington, and the Erimus works, near South Stockton. For this renewal of activity in the staple trades of Durham and Cleveland the North Eastern Company were well prepared.

The railway now quickly regained its position as one of the most remunerative lines in the country, the remarkable growth of traffic during the half year, with a moderate ratio of working expenses—due to contracts made at low prices—having enabled the Company to pay a dividend of 8 per cent.

With the return of prosperity to the North of England, works which had been closed on account of the depression in trade were restarted. At Ferryhill, however, which had been for many years a centre of industrial activity, there was no response to the revival in trade. The disaster which had overtaken the once flourishing Rosedale and Ferryhill Iron Company still lay heavily upon them. One of the partners in this concern was Mr. George Leeman. Broken down in health and fortune, he now resigned his position as chairman of the North Eastern Company, though still remaining a member of the Board. In the building up of the North Eastern system Mr. Leeman had taken a leading part. Coming to the front in the troubled period of 1849, he had assisted in the deposition of the Railway King, subsequently acting as chairman and deputy-chairman of the York, Newcastle and Berwick Company. On the North Eastern Board, to which he was transferred as a representative of the Berwick section of the shareholders, his influence made itself felt at every crisis in the history of the Company. From 1855 to 1874 he occupied the position of deputy-chairman and from 1874 to 1880 that of chairman.

The second half of the year 1880 was even more favourable to the Company than the first. During these six months they carried two million tons of minerals more, and received a larger amount of revenue from this traffic than they had ever done before in the same period. There was a sufficient balance at the credit of the net revenue account to pay the handsome dividend of $8\frac{1}{2}$ per cent. The great feature of the year was the enormous output of pig iron in the Durham and Cleveland district, which exceeded that of any previous year, the total make being 2,416,000 tons. During 1880 the rebate which had been allowed in the charges for

carriage of iron-making materials was reduced by $7\frac{1}{2}$ per cent. and, on the 1st of January, 1881, the directors proposed to revert to the rates of 1871. To this proposal the iron-masters and mine-owners demurred. As a result of negotiations between their representatives and the directors a sliding-scale of railway charges was adopted which has worked satisfactorily ever since. "This sliding scale means," says a recent writer, "that when the iron trade is flourishing and prices are high the Company participates in its prosperity, and that when the price of iron is low the Company shares with iron-masters and wage-earners the burden of meeting the competition of other districts by carrying iron-making materials at low rates."*

In 1886 the North Eastern District was at the bottom of another great commercial depression. After four years of phenomenally good trade, when the Company's annual dividends ranged from 8 to $8\frac{1}{4}$ per cent., the inevitable reaction set in—production got ahead of consumption—and all branches of industry were affected, especially the coal and iron trades upon which the prosperity of the North Eastern so largely depended. In 1884 the dividend fell from $8\frac{1}{4}$ to $6\frac{7}{8}$, in 1885 to 6, and in 1886, when the gross receipts were a million less than in 1883, to $5\frac{3}{8}$. This was $\frac{1}{2}$ per cent. less than the Company paid in the disastrous year of 1879. In 1879 North Eastern consols never rose higher than 151 and sank as low as $126\frac{3}{4}$; in 1886 the points between which they fluctuated were $142\frac{1}{8}$ and $158\frac{3}{4}$.

The great strike of the coal-miners in Yorkshire and the Midlands, which lasted from the 1st of August to the 18th of November, 1893, produced some curious effects in the North Eastern Company's traffic returns. Previous to the strike, most of the coal produced in the northern counties went either to the east coast for shipment or to the iron blast-furnaces. After the outbreak of the strike there was a great rush of Durham and Northumberland coals to the districts previously supplied from Yorkshire and the Midlands, and instead of short leads to the east and west there were long leads to the south. This sudden increase and change in the course of traffic disturbed the ordinary working arrangements of the Company and strained their resources. The supply of waggons fell short of the requirements and large numbers of Midland and Great Northern trucks had to be brought in to meet the deficiency. After the opening of the Dunston extension line, many of the coal trains were taken across the Tyne at Scotswood in order to relieve the High Level Bridge—

* George Paish, *The British Railway Position*, 1902, p. 237.



COAL-SHIPING STAITHS, NORTH BLYTH.

(Opened July 13th, 1896.)

at this time being strengthened by the insertion of additional girders. They were led backwards by a pilot engine on to the Redheugh branch near Blaydon, from which point they steamed away south *via* Dunston and Low Fell.

After the great strike in the Midlands was ended and mineral traffic had flowed back into its ordinary channels, the increase in the volume of trade was still so great that the receipts from mineral traffic in 1891, were only £3,580 less than those of 1893. There was a greatly increased demand for the coal of the district served by the North Eastern in consequence of a strike among the miners in Scotland, which lasted from June 20th to October 15th, 1894, and, from this the Company derived special benefits. But for a strike of the ironmoulders of the north-east coast from March to September, 1894, which threw about 20,000 shipyard men and other workmen idle and led to the closing of ironworks at Middlesbrough and Darlington, the receipts would have been even greater. There was an increase for the year of £55,790 in the receipts from passengers and of £156,518 in those from goods. Altogether, from the point of view of revenue, 1894 was a record year for the North Eastern Railway, the gross receipts from all sources amounting to £7,438,323—the highest point yet reached. A large portion of the additional revenue was, however, absorbed by increased working expenses, chiefly in the first half of the year, attributable to shorter hours of labour, the increased price of fuel and increased payments for rates and taxes. The average dividend for the year was consequently no higher than that of 1893, viz., 5½ per cent.

The death of Mr. John Dent Dent, on the 22nd of December, 1894, deprived the Company of the services of an able and conscientious chairman who, since 1880, had presided with dignity and urbanity over the deliberations of the Board. To the vacant position the directors appointed the deputy-chairman, Sir Joseph Whitwell Pease, Bart., M.P., who had been a member of the Stockton and Darlington Board from 1853 to 1863 and a member of the North Eastern Board since the amalgamation of the older Company with the North Eastern.

The total capital of the Company at this time was £63,323,440, consisting of ordinary stock £26,277,375, preference shares and stocks £20,751,805, debenture stocks £15,963,061 and loans, etc., £341,119. The preference stocks were thirteen in number, bearing interest at varying rates—five at 4 per cent., one at 4½ per cent., two at 5 per cent., one at 5½ per cent. and four at six per cent. In order to simplify the accounts it was decided to

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PLATE XXXIX.



From a lithographed portrait.

Published by Morris & Co.

Sir Joseph Pease, Bart., M.P. —Chairman, 1894-1902.

convert the two debenture stocks into a single 3 per cent. stock and to consolidate twelve of the preference stocks and shares into two stocks—a guaranteed and preference stock—each bearing interest at the rate of 4 per cent. A Bill to effect this object was brought in and received the Royal Assent on the 6th of July, 1895. In effecting the conversion a nominal addition of £5,599,940 was made to the amount of the debenture stocks, of £818,573 10s. to the amount of the guaranteed stocks, and £200,625 to the amount of the preference stocks. The only links with the past now left in the North Eastern accounts were the “Great North of England purchase stock and shares,” not yet exchanged for North Eastern consols, the loans raised in the exercise of the powers of the Great North of England, Clarence and Hartlepool Junction Railway Company, and the “West Hartlepool primary charges” still undischarged, the two former items carrying the mind back to the days of George Hudson, the latter recalling the constructive work of Ralph Ward Jackson.

A record revenue of £7,738,128 crowned the following year's work, an increase of £422,529 which was due, not to circumstances of a quite exceptional character, as in 1894, but to the general activity of the staple trades of the district. This large amount of revenue had been earned by carrying nearly 36,000,000 tons of minerals, over ten million tons of goods and 47,000,000 passengers exclusive of the holders of periodical tickets. North Eastern consols had risen to 184½, the highest point attained since 1872 and the dividend for the whole year was 6½ per cent. The steady increase in the volume of traffic pointed to a continuous improvement in trade and gave promise of a succession of good years to come.

Taking advantage of these prosperous circumstances the Company besides committing themselves to a heavy outlay on new works were renewing and adding to their working stock on a larger scale. During the years 1898-9-00 they expended a million pounds under this head of capital, or nearly as much as they had expended for the same purpose during the seven previous years. The latter years of the nineteenth century coincided with a great trade cycle during which the annual revenue of the North Eastern Company rose from seven millions to eight millions in four years, and from eight millions to nine millions in three years. Once only had the annual revenue increased at a more rapid rate and that was in 1870-3 when, in four years, it rose from four to six millions, but there was a special cause for this increase—the inflation of the trade of the country consequent upon the Franco-German war—and when that inflation ceased, it took seventeen years to raise the

annual revenue from six to seven millions. A satisfactory feature of this later development was the increase in the receipts from first class passengers. This was partly attributable, to the abolition of the second class on all but a few lines on the 1st of May, 1893, and on these few lines on the 31st of March, 1899, but in the main it seems to have been due to the cheap rates and the thousand-mile tickets introduced in 1896.

The growth of the revenue was not accompanied by a proportional rise in the dividend. The average dividend paid in 1894 was $5\frac{7}{8}$; in 1895, $5\frac{5}{8}$; in 1896 it rose to $6\frac{3}{8}$; in 1898 to $6\frac{1}{2}$, and in 1899 to $6\frac{5}{8}$ per cent. (during which year North Eastern consols touched $185\frac{1}{8}$ —the highest point ever reached by them) but in 1900 it dropped to $6\frac{3}{8}$ per cent. The explanation is found in the unprecedented increase of the working expenses. While in 1894 the ratio of the working expenses to the receipts was 57·55, in 1900 it was 62·73 per cent. In 1901 when a decrease of £102,000 in the gross revenue was accompanied by an increase in the working expenses of £144,000, the proportion of expenses to receipts was no less than 65 per cent.

The half-yearly general meeting of the 15th of August, 1902, was one that stands out prominently in North Eastern Railway history because of the important announcements made on that occasion with regard to the successful completion of the reorganisation of the traffic departments, the introduction of improved methods of working, the electrification of the Tynemouth Riverside and Quayside branches, and the arrangement for the joint construction and ownership by five companies of the South Yorkshire line, a notable example of railway co-operation. The shareholders met under more favourable auspices in August than in February when they were faced with a decrease in the gross receipts of £61,000, and an increase in the working expenses of £46,000. In August there was an increase to report in the working expenses—but of £9,000 only, and an increase in the gross receipts of £29,000. Consequently the chairman had no difficulty in convincing the shareholders that the directors had “a fairly good statement to lay before them in somewhat adverse times.” One satisfactory feature of the accounts was the decrease in the expenses of the locomotive department of £59,000 due principally to the lower price of fuel, another was the decrease in goods and mineral train miles of 626,000 notwithstanding a substantial increase of traffic.

Neither directors nor shareholders were apparently aware of any circumstances likely to affect the monetary interests of the Company. A week later the shadow of misfortune lay over the Company. Messrs. J. and J. W. Pease, their bankers at Darlington found themselves unable to meet their financial

To face page 758.

PLATE XL.



Hubert Herkomer, R.A., pinxt.

H. Scott Bridgwater, sc.

Viscount Ridley—Chairman, 1902-1904.

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engagements and suspended payment. The credit balance of the North Eastern Company at the time of the stoppage was over £230,000. It was, of course, impossible for Sir Joseph Pease, the principal partner in the Bank, to retain his seat on the North Eastern Board of which he had been a member since 1863—for seven years as deputy-chairman, and nearly eight years as chairman. Lord Ridley was elected chairman in his stead. The Creditors of the Bank agreed to an arrangement under which the assets of the firm were supplemented by the contributions of personal friends amounting to £140,000 or thereabouts. It was estimated that under this arrangement, the total loss to the North Eastern Company would not exceed £125,000, and this amount the directors decided to charge against a fund prudently provided to meet bad debts and contingencies.

On the 31st of July, 1904—the year that saw the establishment of the electric train service and the installation of power and automatic signalling—the North Eastern Railway Company attained its jubilee. Half a century of change and incident! and yet the memory of one honoured member of the Board was able to bridge the whole period. To Mr. Henry Tennant, accountant of the railway in 1854, and director in 1904, the retrospect must have seemed like the unveiling of some marvellous, yet familiar picture. In 1854 the North Eastern system comprised 703 miles of railway open for traffic; in 1904 it comprised 1,670 miles, but while in 1854 the total length of line, with sidings, was only equal to about 1,500 miles of single track, in 1904 it represented over 4,500 miles. Of these, 53 miles had been added during the year ending June 30th, 1904, in the shape of second, third and fourth tracks. One of the Company's new lines—from Seaham to Hart (9 miles)—was completed but not opened for traffic; another, the Gosforth and Ponteland (7½ miles) was approaching completion. In July, 1854, one of Mr. George Hudson's schemes—the Axholme, Gainsborough, Goole, and York and North Midland Railway—was being wound up; in July, 1904, the last section of the Axholme Joint Railway between Crowle and Haxey, passing through the same district, was within a few months of being opened for traffic. Besides their 1,670 miles of railway, the North Eastern Company, in 1904, had 17 docks with tidal harbours, basins and timber ponds, having a total water area of over 440 acres, on the Tyne, the Wear, and at Hartlepool, West Hartlepool, Middlesbrough, and Hull—most of them acquired or constructed since 1854—and important shipping places at North and South Blyth and Dunston.

The authorised capital of the Company had grown from 23 millions in 1854 to 87 millions in 1904, and their revenue from about £1,600,000 per

annum to £9,300,000 per annum, or from £2,320 to £5,560 per mile worked. To earn this large amount of revenue they were carrying 55,000,000 passengers a year (without counting the holders of periodical tickets), 13,000,000 tons of general merchandise, and 42,000,000 tons of minerals, their passenger trains running 15,000,000 miles, and their goods and mineral trains 12,000,000 miles in the performance of this enormous quantity of work.

For fifty years the North Eastern Railway had served a district possessing magnificent mineral resources. In the industrial expansion of this territory it had been an important economic factor. It was proved in 1854 to the satisfaction of a committee of the House of Commons that "the full development of the traffic of the district depended upon the existence of a uniform system of management and unity of interest in the lines traversing it," and the remarkable progress of the district, commercially and industrially, during the course of half a century more than justified the conclusions of the committee. At the close of this eventful period, when the demand for the nationalisation of railways was making itself heard, the North Eastern general manager, by an interesting coincidence, gave expression to a view almost identical with that which had been set forth by the Committee of 1854. Acknowledging a presentation from the officers of the Company in celebration of the honour of knighthood conferred upon him, Sir George Gibb declared with all the force of experience and authority that there was no belief connected with railway policy and administration which he held with firmer confidence than that each great district should, in the public interest, be served by one undertaking under one management, thereby securing the highest combination of efficiency with economy of effort.

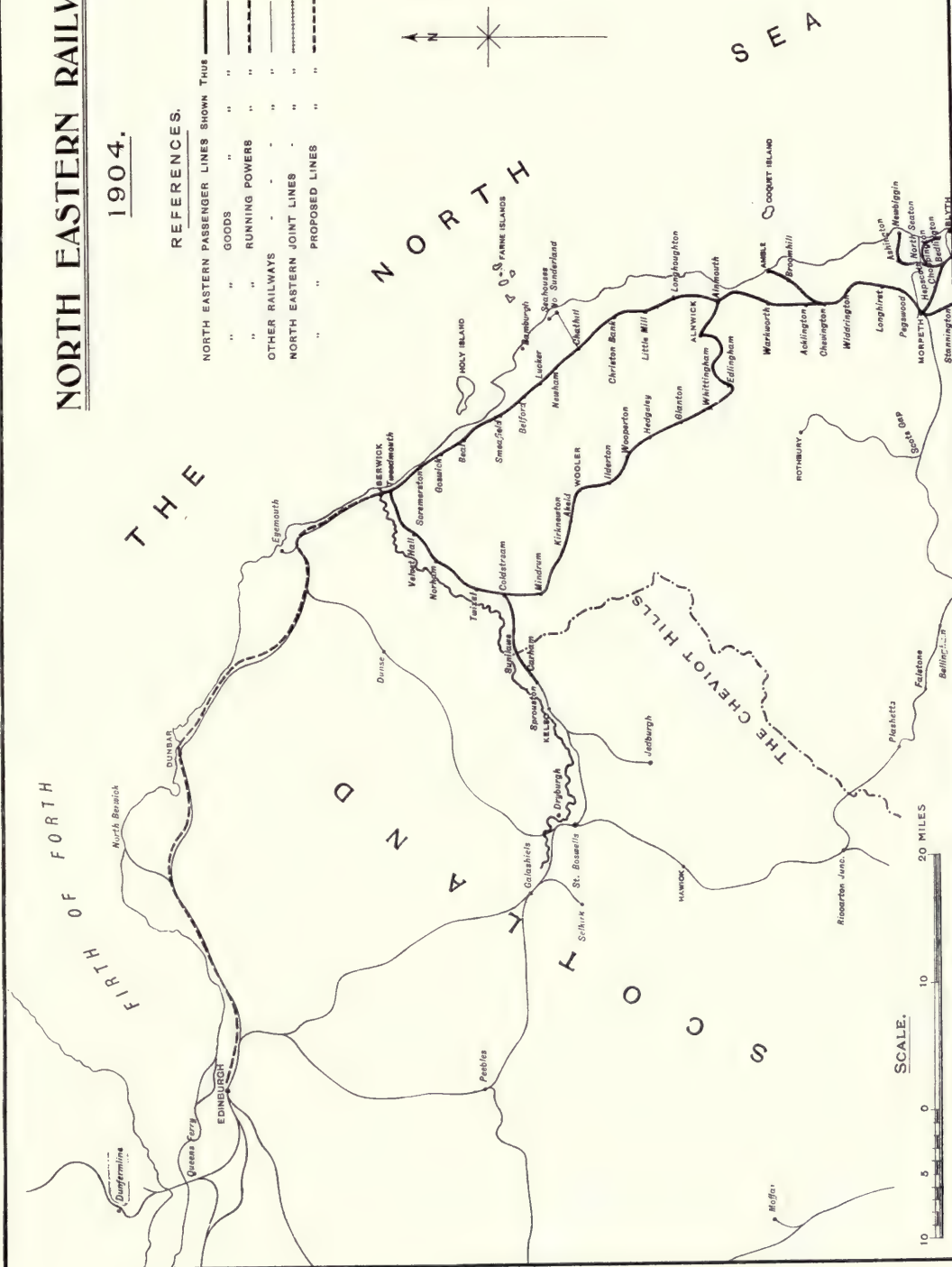


NORTH EASTERN RAILWAY.

1904.

REFERENCES.

NORTH EASTERN PASSENGER LINES SHOWN THUS	
" " GOODS	—
" " RUNNING POWERS	- - -
OTHER RAILWAYS	—
NORTH EASTERN JOINT LINES	- - -
" " PROPOSED LINES	---



Continued on next page.

APPENDIX A.

A RECORD OF EVENTS FROM AUGUST, 1904, to JUNE, 1914.

1904.

- Aug. 29. Derwenthaugh Branch (Norwood Junction to Derwenthaugh Junction) opened for through goods and mineral traffic.
- Nov. 4. Section of Axholme Joint Line—between Crowle and Haxey—opened for goods traffic.
- Nov. 28. Death of the Chairman, Viscount Ridley.
- Dec. 12. The new portion of Hull Paragon Station opened for traffic.
- Dec. 16. Sir Edward Grey, Bart., elected Chairman.
- Dec. 20. Death of Sir Lowthian Bell, Bart., Deputy-Chairman since 1895.
- Dec. 28. Axholme Joint Line opened throughout for passenger traffic.

1905.

- Jan. 13. Earl Grey, the new Governor-General of Canada, resigned his seat on the Board.
Viscount Ridley appointed a director.
- Mar. 1. Dunston Goods Station opened.
Ponteland Branch opened partially for goods and mineral traffic.
- Mar. 13. Completion of electro-pneumatic signalling at Tyne Dock.
- April 1. Auto-cars began running between the Hartlepools.
Seaham and Hartlepool branch opened for passenger traffic.
- April 23. Death of Mr. William Benson Richardson, a director since 1882.
- June 1. Ponteland Branch opened for passenger traffic.
- June 2. Sir Walter Plummer and Mr. Roland Philipson appointed directors.
- June 4. Electric automatic signalling introduced on the main line between Alne and Thirsk.
- June 23. Mr. Henry Tennant elected a deputy-chairman and the Hon. Lord Wenlock appointed a director.
- Aug. 5. Axholme Joint Light Railway (Hatfield Moor Extension) order. Power to construct jointly with the Lancashire & Yorkshire Company, new light railways about $5\frac{1}{4}$ miles in length.

1905.

- Aug. 11. N.E.R. Act. New railways and works in the counties of Northumberland and Durham; widenings of railways; dock works at Hartlepool and Hull.
- Aug. 11. N.E.R. (Steam-Vessels) Act. Power to own and use vessels for the conveyance of traffic between Hull and Dunkirk, Bruges, Ghent, Flushing, Heyst (otherwise Zeebrugge), Antwerp, Delfzyl, Hamburg, Lübeck, Stettin, Dantzic, Copenhagen, Aarhus, and Stockholm.
- Sep. 22. Mr. Francis Richard Pease, a director since 1890, retired from the Board.
- Nov. 28. Collapse of Quay Wall at Dunston Staiths.
- Dec. 1. Service of petrol electric auto-cars installed between Billingham Junction and Port Clarence.
- Dec. 15. Lord Londonderry appointed a director.
- Dec. 15. Sir Edward Grey resigned the chairmanship and retired from the Board upon his appointment as Secretary of State for Foreign Affairs.

1906.

- Jan. 1. The Company acquired a half-share with Messrs. Thomas Wilson & Co., Ltd., in steamers trading between Hull and the ports of Hamburg, Antwerp, Ghent, and Dunkirk.
- Jan. 11. Sir George S. Gibb's resignation of the office of General Manager consequent upon his appointment as Chairman of the Metropolitan District Railway Company and Managing Director of the Underground Electric Railways Company of London, reported to the Board.
- Feb. 9. The Right Hon. John Lloyd Wharton elected Chairman and Lord Knaresborough a deputy-chairman.
Sir George S. Gibb, appointed a director.
- Mar. 2. Mr. A. Kaye Butterworth appointed General Manager.
- April 28. Death of Sir David Dale, Bart., a director since 1881.
- May 25. Mr. Arthur Francis Pease appointed a director.
- July 10. New High Level Bridge over the Tyne at Newcastle formally opened by King Edward VII.
- Sept. 19. Mr. Roland Philipson, one of the directors, killed in a railway accident at Grantham.
- Sep. 20. Opening of New Offices at York.
Board Room, used for the first time for Directors' meeting, September 30.

1906.

- Oct. 1. King Edward VII. Bridge at Newcastle permanently opened. New Bridge Street Goods Station, Newcastle, partially opened.
- Nov. 2. Mr. Frank Fitzroy Lambert appointed a director.
- Nov. 24. Collision between Scarborough and Leeds express and mineral train near Ulleskelf. Driver and fireman killed.

1907.

- Jan. 1. North Eastern Railway Servants' Pension Society established.
- Jan. 2. Goods Station, New Bridge Street, Newcastle, completely opened and Trafalgar Station closed.
- Mar. 26. Accident to Leeds and Newcastle express at Felling. Eight passengers injured, two of them fatally.
- April 22. Dunston to Gateshead Extension (King Edward Bridge Junction West to Norwood Junction), opened for goods and mineral traffic.
- May 10. New swing bridge over the river Hull at Sculcoates completed.
- May 11. New Riverside Quay at Hull brought partially into use in connection with the Hull-Zeebrugge steamship service, run jointly by the North Eastern and Lancashire and Yorkshire Companies.
- June 1. Seaton Snook branch opened for goods traffic.

1908.

- Jan. 5. The Widening of the Consett Branch between Blaydon Junction and Lockhaugh Junction completed and brought into use.
- Feb. 24. Curve from Consett Branch to Redheugh Branch (Swalwell Junction to Blaydon Main Colliery Junction) opened for goods traffic.
- May 29. Lord Armstrong a director since 1901, retired from the Board.
- June 8. New excursion station, Scarborough, opened.
- June 16. Atlas Curve (Dunston West Junction to Whickham Junction) opened for goods traffic.
- June 19. Mr. John Henry Brunel Noble appointed a director.
- Aug. 10. N.E.R. Act—New railways and works in the County of Durham, about $4\frac{1}{2}$ miles in length.
- Aug. 14. A scheme for the formation of a Conciliation Conference for the settlement of disputes arising between the Company and their workmen received the sanction of the Board.

1908.

Oct. 14. New Railway Literary Institute opened at Sunderland.

Dec. 14. The new mineral shunting yard at Newport (Middlesbrough) brought into use.

1909.

Jan. 1. South Yorkshire Joint Line opened for traffic.

Dunston to Gateshead Extension opened for passenger traffic.
Junction line between Manors East Station on the main line and
Jesmond Station on the Blyth and Tyne section of the
North Eastern Railway opened for traffic.

Jan. 5. Hatfield Moor Branch of Axholme Joint Line partially opened
for traffic. Fully opened, Feb. 22.

Feb. The goods marshalling yard at Hull brought into use.

Mar. 30. First Meeting of the N.E.R. Conciliation Conference.

June 10. New High Level Bridge over the Wear, constructed for railway
and road traffic at the joint cost of the Corporation of
Sunderland and the Company, opened by The Earl of
Durham.

July 1. High Westwood and Benton Square stations opened.

Aug. 16. Lancashire and Yorkshire and North Eastern Railways Act—
Power to construct jointly the Hatfield Moor Further
Extension Railway, 8m., 5f., 4ch. in length; and for
other purposes.

Sept. 20. N.E.R. Act—New railways and works in the Counties of North-
umberland and Durham, East Riding of Yorkshire, and at
Hull, about $4\frac{1}{2}$ miles in length; Widening of Hull and
Doncaster Branch about $1\frac{1}{4}$ miles.

Oct. 21. Death of Mr. Arthur Wilson, a director since 1893.

Nov. 4. Award of Sir James Woodhouse as to wages and conditions of
service of the Company's railway staff.

Nov. 8-12. Installation of electro-pneumatic signalling at the Central
Station, Newcastle.

Nov. 18. New coal shipping staiths at Hartlepool, the first two spouts of
which had been brought into use on the 1st of January,
completed.

1910.

Jan. 28. Mr. Oswald Sanderson of Hessle appointed a director.

1910.

- Feb. 28. The Hull Corporation refused to consent to the proposed working agreement between the N.E.R. and Hull and Barnsley Companies.
- May 25. Death of Mr. Henry Tennant, joint deputy-chairman.
- June 3. Public demonstration of improved method of shipping coals at Victoria Dock, Hull, by means of rubber belt worked by a gas engine.
- July 18-21. Strike of N.E.R. men on Tyneside arising out of the transference of a shunter from one part of Park Lane Goods Yard to another.
- July 22. Mr. Arthur Greenhow Lupton appointed a director.
- Aug. 26. Renewed labour dispute on the N.E.R. settled.
- Oct. 7. Retirement of Sir George Gibb from the Board.
- Oct. 9. New Station at Whitley Bay partially opened.
- Nov. 1. Goole and Selby Line opened for mineral traffic, and for goods traffic on the 1st of December.
- Dec. 5. New Fish Quay at Victoria Dock, Hartlepool, opened.

1911.

- Jan. 27. Earl Grey re-appointed a director.
- Feb. 3-4. Strike of N.E. men at Hull in support of six fish-porters dismissed from the Hull Paragon Station.
- Mar. 8-11. Strike of carriage cleaners, Central Station, Newcastle.
- Mar. 16. Death of Lord Airedale, a director since 1885, and chairman of the Loco. Committee.
- April 19-21. Strike of shunters at Thirsk.
- May 4. The Marquis of Londonderry resigned his seat on the Board. Viscount Castlereagh, M.P., elected to succeed him.
- May 26. The Hon. Roland Dudley Kitson appointed a director.
- July 1. New offices in Westgate Road, Newcastle (Irving House), opened.
- Aug. 1. New Bridge, carrying the Holgate Road over the Railway at York opened.
- Aug. 18. N.E.R. Act—New railways and works in the County of Northumberland, about 4 miles in length; widenings of railways about $6\frac{1}{2}$ miles in length; extension of time for completion of Brackenhill Light Railway.
- Aug. 17. National Strike of Railway Servants. The North Eastern men, though not affected by the questions at issue, joined the strike movement without notice.

1911.

- Aug. 25. Sympathetic strike of N.E.R. men brought to an end.
- Aug. 28—Hearing of evidence by the Royal Commissioners on the work-
 Oct. 3. ing of the Railway Conciliation scheme of 1907.
- Oct. 1. Eryholme Station closed.
- Oct. 20. Report of the Royal Commission issued. Conference between
 the representatives of the Railway Companies (other than
 the N.E.R.), and the Board of Trade resulting in an agree-
 ment to accept the recommendation of the Royal Com-
 mission.

1912.

- Jan. 14. Death of Lord Wenlock, a director from 1888 to 1891 and 1905
 to 1912.
- Feb. 26—National Strike of Coal-miners.
- April 6.
- April 8. New Offices on Stoopsdale estate, Darlington, occupied by the
 Staff of the Chief Mechanical Engineer.
- April 19. Mr. Murrough John Wilson appointed a director.
- May 1. Selby and Goole line opened for passenger traffic.
- June 7. Meeting of the N.E.R. Conciliation Conference at which
 concessions affecting nearly 9,000 men were mutually
 agreed to.
- July 11. Death of the Chairman, the Right Hon. John Lloyd Wharton,
 a director since 1880.
- July 26. Lord Knaresborough appointed chairman and Lord Joicey
 deputy-chairman.
 Viscount Helmsley, M.P., appointed a director.
- Oct. 29. Section of the Derwent Valley Light Railway from Cliff
 Common to Wheldrake opened for goods and mineral
 traffic, etc.
- Dec. 7. Seven thousand North Eastern Railway men left work without
 notice in consequence of the Chief Mechanical Engineer
 having reduced in position an engine driver who had been
 fined by the Newcastle Bench of Magistrates for drunken-
 ness.
- Dec. 14. Settlement of the strike of the N.E.R. men.

1913.

- Jan. 1. The Railway Companies' (Accounts and Returns) Act, 1911, came into force.
- Jan. 16. New entrance to West Hartlepool Docks first used.
- Feb. 14. Shareholders' approval given to agreement between the North Eastern Railway Company and the Swaledale Light Railway Company, as to the construction and working by the Company of the proposed light railway from Richmond to Reeth, authorised by the Swaledale Light Railway order, 1912.
- June 16. The electrification of $18\frac{1}{2}$ miles of railway (50 miles of single track) between Shildon and Newport, Middlesbrough, begun.
- July 19. Derwent Valley Light Railway formally opened throughout.
- July 31. Railway between Brampton Junction and Brampton Town, which had been taken over and relaid by the Company, opened for passenger traffic.
- Aug. 1. Brampton Town Station opened for traffic.
- Sep. 27. Darras Hall Extension of the Ponteland Railway formally opened.

1914.

- June 26. Joint Dock at Hull (North Eastern and Hull and Barnsley Companies) opened by King George V., and named the "King George Dock."



Photo by

R. J. Purves.

KING EDWARD VII. BRIDGE, NEWCASTLE, WITH
SCOTCH EXPRESS PASSING OVER IT.

APPENDIX B.

LIST OF DIRECTORS FROM THE AMALGAMATION IN
1854 TO 1914.

Name.	Date of Election.	Date of Retirement or Death.
Airedale, Lord	1st May, 1885	Died, 16th March, 1911
Armstrong, Lord	3rd May, 1901	Resigned, 29th May, 1908
*Bell, Sir Hugh, Bart.	9th January, 1903	—
Bell, Sir Lowthian, Bart.	4th August, 1865	Died, 20th December, 1904
Cash, Newman	From Leeds Northern Rail'y	Died, 1st August, 1866
*Castlereagh, Viscount	4th May, 1911	—
Cleghorn, John	17th February, 1871	Resigned, January, 1904
Copperthwaite, William Charles	18th February, 1859	Resigned, 8th February, 1889
*Cunliffe, Walter	12th February, 1904	—
Dale, Sir David, Bart.	1st July, 1881	Died, 28th April, 1906
Dent, John Dent	18th July, 1879	Died, 22nd December, 1894
Derwent, Lord	23rd December, 1864	Resigned, 26th January, 1888
Dodsworth, George	From York and North Mid- land Railway	Died, 24th January, 1880
Duncombe, Hon. Cecil	5th December, 1879	Died, 20th May, 1902
Dunn, William	Appointed under Newcastle and Carlisle Amalgama- tion Act, 1862	Died, 9th September, 1862
Elliot, John Fogg	Do.	Died, 11th February, 1881
Fenwick, George	20th February, 1868	Died, 16th January, 1883
Feversham, Earl of	21st June, 1872	Retired, December, 1879
Gibb, Sir George Stegmann	9th February, 1906	Resigned, 7th October, 1910
Gray, Sir William	8th January, 1886	Died, 12th September, 1898
*Gray, William Cresswell	7th October, 1898	—
*Grey, Earl	19th June, 1885. Re- elected 27th Jan., 1911	Resigned, 13th January, 1905
Grey, Sir Edward, Bart.	22nd July, 1898	Resigned, 26th January, 1906
Hartley, James	22nd February, 1856	Died, 24th May, 1886
*Helmsley, Viscount	26th July, 1912	—
Hodgson, James	From York, Newcastle and Berwick Railway	Died, 22nd December, 1867
Hunter, William Rutherford	Do.	Died, 12th April, 1881

Name.	Date of Election.	Date of Retirement or Death.
Hutchison, Graham	23rd February, 1855	Resigned, 11th July, 1856
*Joicey, Lord	8th February, 1889	—
Kitching, Alfred	21st November, 1866	Died, 13th February, 1882
Kitson, James	From Leeds Northern Rail'y	Retired, 2nd April, 1885
*Kitson, Hon. Roland Dudley	26th May, 1911	—
*Knaresborough, Lord	13th February, 1874	—
Laing, Sir James	18th June, 1886	Died, 15th January, 1902
*Lambert, Frank Fitzroy	2nd November, 1906	—
Laycock, Joseph	14th August, 1874	Died, 2nd August, 1881
Leechmann, James	From York, Newcastle and Berwick Railway	Died, October, 1855
Leeman, George	Do.	Died, 25th February, 1882
Londonderry, Marquis of	15th December, 1905	Resigned, 4th May, 1911
Lumsden, John	21st June, 1872	Died, July, 1876
*Lupton, Arthur Greenhow	22nd July, 1910	—
McLaren, Duncan	From York, Newcastle and Berwick Railway	Retired, 23rd February, 1855
MacLea, Charles Gascoigne	From Leeds Northern Rail'y	Died, 24th May, 1864
Morton, Henry Thomas	5th October, 1881	Died, 23rd June, 1898
*Noble, John Henry Brunel	19th June, 1908	—
Oxley, Henry	2nd November, 1866	Died, 22nd February, 1890
*Pease, Arthur Francis	25th May, 1906	—
Pease, Francis Richard	20th June, 1890	Resigned, 22nd Sept., 1905
Pease, Henry	8th February, 1861	Died, 30th May, 1881
Pease, Sir Joseph Whitwell, Bart.	Appointed under Stockton and Darlington Amalga- mation Act, 1863	Resigned, 10th October, 1902
Pease, John William	2nd March, 1883	Died 25th March, 1901
Philipson, Roland	2nd June, 1905	Killed in Grantham Railway Accident, 19th Sept., 1906
Plews, Nathaniel	From York, Newcastle and Berwick Railway	Died, 12th November, 1859
*Plummer, Sir Walter	2nd June, 1905	—
Priestman, Samuel	From York and North Mid- land Railway	Died, 11th April, 1872
Pulleine, James	From York, Newcastle and Berwick Railway	Retired, 19th February, 1864
Richardson, William Benson	4th August, 1882	Died, 23rd April, 1905
Ridley, Viscount	6th May, 1881	Died, 28th November, 1904

Name.	Date of Retirement or Death.	Date of Election.
*Ridley, Viscount	13th January, 1905 ...	—
*Sanderson, Oswald	28th January, 1910	—
Seymour, George Hicks	From York and North Mid- land Railway	Died, 16th April, 1872
Stobart, Col. Henry	Appointed under Stockton and Darlington Amalga- mation Act, 1863	Died, 26th August, 1866
*Stobart, Frank	10th January, 1902... ..	—
Straker, John	6th May, 1881	Died, 4th April, 1885
Tennant, Henry	1st May, 1891	Died, 25th May, 1910
Thompson, Harry Stephen (afterwards Sir H. S. Meysey- Thompson, Bart.)	From York and North Mid- land Railway	Retired, February, 1874
*Turton, Edmund Russborough ...	18th July, 1902	—
Wenlock, Lord	10th February, 1888. Re- elected 23rd June, 1905	Resigned, 9th January, 1891 Died, 14th January, 1912
Wharton, Right Hon. John Lloyd	13th February, 1880 ...	Died, 11th July, 1912
Wharton, William Lloyd ...	From York, Newcastle and Berwick Railway	Retired, 17th February, 1865
Williamson, Robert	From York and North Mid- land Railway	Died, 27th November, 1864
Wilson, Arthur	20th October, 1893	Died, 21st October, 1909
Wilson, Charles Henry (afterwards Lord Nunburnholme)	13th February, 1874 ...	Retired, December, 1879
Wilson, David	19th December, 1879 ...	Died, 25th February, 1893
Wilson, Isaac	Appointed under Stockton and Darlington Amalga- mation Act, 1863	Retired, June, 1879
*Wilson, Murrough John	19th April, 1912	—
*Wood, Sir Lindsay, Bart.	8th February, 1895... ..	—
Woods, William	13th February, 1863 ...	Died, 12th June, 1864
Young, William Joseph	24th February, 1882 ...	Died, 3rd November, 1885

* Member of Board, June, 1914.

APPENDIX C.

LIST OF CHAIRMEN, DEPUTY-CHAIRMEN AND PRINCIPAL OFFICERS, 1854 to 1913.

CHAIRMEN.

James Pulleine	...	...	...	...	...	1854-1855
Harry Stephen Thompson	...	...	...	...	...	1855-1874
George Leeman	...	...	...	...	...	1874-1880
John Dent Dent	...	...	...	...	...	1880-1894
Sir Joseph Whitwell Pease, Bart.	...	...	...	...	...	1895-1902
The Right Hon. Viscount Ridley	...	...	...	...	...	1902-1904
The Right Hon. Sir Edward Grey, Bart.	...	...	...	...	...	1904-1905
The Right Hon. John Lloyd Wharton	...	...	...	...	...	1906-1912
The Right Hon. Lord Knaresborough	...	...	...	...	...	1912-

DEPUTY CHAIRMEN.

Harry Stephen Thompson	...	...	...	...	...	1854-1855
George Leeman	...	...	...	...	...	1855-1874*
John Dent Dent	...	...	...	...	...	1880-
The Right Hon. Lord Derwent	...	...	...	...	...	1881-1888
Sir Joseph Whitwell Pease, Bart.	...	...	...	...	...	1888-1895
Sir Lowthian Bell, Bart.	...	...	...	...	...	1895-1904
The Right Hon. John Lloyd Wharton	...	...	...	...	...	1905-1906
Henry Tennant	...	...	...	...	...	1905-1910†
The Right Hon. Lord Knaresborough	...	...	...	...	...	1906-1912
The Right Hon. Lord Joicey...	...	...	...	...	...	1912-

GENERAL MANAGERS.

Thomas Elliot Harrison	...	...	...	...	...	1854-
Captain William O'Brien	...	...	...	...	...	1854-1871
Henry Tennant	...	...	...	...	...	1871-1891
George Stegmann Gibb	...	...	...	...	...	1891-1906
Alexander Kaye Butterworth	...	...	...	...	...	1906-

* There was no Deputy Chairman between 1874 and 1880.

† The position of Chairman was held jointly during these years—by Mr. Wharton and Mr. Tennant, 1905-6, and by Mr. Tennant and Lord Knaresborough, 1906-10.

SOLICITORS.

George Stegmann Gibb	...	...	...	...	...	1882-1891
Alexander Kaye Butterworth	...	...	...	...	...	1891-1906
Robert Francis Dunnell	...	...	...	...	...	1906-

SECRETARIES.

Captain William O'Brien	...	...	...	...	...	1854-1856*
John Cleghorn	...	...	...	...	...	1856-1870
Christopher Newman Wilkinson	...	...	...	...	...	1871-1903
Ralph Lewis Wedgwood	...	...	...	...	...	1904-1905
Robert Francis Dunnell	...	...	...	...	...	1905-

LOCOMOTIVE SUPERINTENDENTS—CHIEF MECHANICAL ENGINEERS.

Edward Fletcher	...	...	...	...	...	1854-1882
Archibald Macdonnell	...	...	...	...	...	1882-1884
Thomas William Worsdell	...	...	...	...	...	1885-1890
Wilson Worsdell (Title from 1902: Chief Mechanical Engineer)	...	...	...	...	...	1890-1910
Vincent Litchfield Raven (Title: Chief Mechanical Engineer)	1910-

ENGINEER-IN-CHIEF.

Thomas Elliot Harrison	1854-1888
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CHIEF ENGINEERS (DIVISIONAL).

Northern Division.

Alfred Reed Clanny Harrison	1888-1889
Charles Augustus Harrison (Consulting Engineer, 1908)	...	...	...	...	...	1889-

Central Division.

Joseph Cabry	...	...	...	...	...	1888-1891
William John Cudworth	...	...	...	...	...	1891-1899

Southern Division.

Harold Copperthwaite	...	...	...	...	...	1888-1899
William John Cudworth	...	...	...	...	...	1899-1909
Cyril Francis Bengough (Engineer for Maintenance of whole Line, 1912-)	...	...	...	...	...	1909-

* Captain O'Brien continued to act as Secretary for two years after being appointed General Manager.

ENGINEERS FOR DOCKS.

Thomas Monk Newell	...	...	...	...	...	1899-1913
Charles Watson	...	...	...	...	...	1913-

ARCHITECTS.

Thomas Prosser	...	...	...	...	...	1854-1874
Benjamin Burleigh	...	...	...	...	...	1874-1876
William Peachey	...	...	...	...	...	1876-1877
Willam Bell	...	...	...	...	...	1877-

ESTATE AGENTS.

George Irving (Title: Rent Collector)	...	...	...	1855-1871
„ „ (Title: Estate Agent)	...	...	...	1871-1906
Arthur Garvin Stevenson	...	...	...	1906-

GENERAL TRAFFIC MANAGER.

Alexander Clunes Sherriff	1854-1856
* * *					

[Title revived in 1900.]

Philip Burt	1900-1911
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PASSENGER SUPERINTENDENTS (Whole Line).

Alexander Christison (General Passenger Superintendent)	1856-1890
William Blackader Johnson	Do. 1890-1891
John Welburn	Do. 1891-1892

[Title of General Passenger Superintendent merged in that
of Superintendent of the Line.]

John Welburn (Superintendent of the Line)*	...	...	1892-1897
Philip Burt	Do.	...	1897-1900
Henry Angus Watson	Do.	...	1900-1902

[Duties of Superintendent of the Line redistributed between
General Superintendent and Chief Passenger Agent.]

Henry Angus Watson (General Superintendent)	...	...	1902-
Edwin Louis Davis (Chief Passenger Agent)	...	...	1902-1911

[Title of Chief Passenger Agent merged in that of Passenger
Manager.]

Philip Burt (Passenger Manager)	1911-
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* In 1892 and 1900 the charge of running goods and mineral trains and working the principal marshalling and shunting yards which had previously been under the control of the Goods Department was transferred to the Superintendent of the Line.

GOODS MANAGERS (DIVISIONAL).*

Northern Division.

William Lister Newcombe	...	...	...	...	...	1854-1855
Alexander Allan	...	...	...	...	...	1855-1861

Southern Division.

Robert Walter Bailey...	...	...	...	...	...	1854-1855
James Wilson	...	...	...	...	...	1855-1861

GOODS MANAGERS (WHOLE LINE).

James Wilson	...	...	...	...	...	1861-1872
Robert Pauling (Title from 1876: General Goods Manager)	...	...	...	...	...	1872-1891
Charles Jesper	...	...	...	...	...	1891-1900
William Robinson (Title from 1902: Chief Goods Manager)	...	...	...	...	...	1900-1906
Eric Campbell Geddes	...	...	...	...	...	1907-1912
Ralph Lewis Wedgwood	...	...	...	...	...	1912-

MINERAL MANAGERS† (DIVISIONAL).

Northern Division.

John George Quelch	...	...	...	...	...	1854-1874
Robert Urwin (Indoor)	...	...	...	...	...	1874-1880
Thomas Audus (Outdoor)	...	...	...	...	...	1874-1880
„ „	...	...	...	...	...	1880-1898
Joseph Fairless	1898-1902

Southern Division.

Robert Walter Bailey	1855-1890
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ACCOUNTANTS.

Henry Tennant	1854-1871
William Tidswell	1871-1891
Thomas Waddington	1892-1902
Ralph Teasdale Swinburn	...	...	...	...	...	1903-

* Prior to 1861 there was no officer in the Goods Department having the supervision of the whole line.

† The duties previously performed by the Mineral Managers are now divided between the General Superintendent and the District Goods Managers.

TREASURERS—CHIEF CASHIERS.

Henry Smiles ...	...	...	...	...	...	1871-1876
Edward Towns ...	...	...	...	...	...	1876-1886
John Edward MacNay ...	...	...	...	...	...	1886-1893
Arthur Tranah ...	...	...	...	...	...	1893-1906
Joseph Hector Goodfellow Dickinson (Title: Chief Cashier) ...	...	...	...	...	...	1907-

STORES SUPERINTENDENTS.

George Henry Barnes ...	...	...	...	...	1855-1872
George Lucas ...	...	...	...	...	1872-1890
Edward Hawley Clark ...	...	...	...	...	1890-



Photo by

R. J. Purves.

THE FASTEST TRAIN IN THE BRITISH EMPIRE—THE

12-20 P.M. NEWCASTLE—SHEFFIELD EXPRESS.

(Engine No. 1232. Class R.

APPENDIX D.

CAPITAL EXPENDITURE. GROSS REVENUE. PERCENTAGE OF WORKING
EXPENSES TO RECEIPTS, AND DIVIDEND ON ORDINARY STOCK, DURING
THE YEARS 1854 TO 1913 INCLUSIVE.

Year.	Capital Expenditure at 31st December.	Gross Revenue.	Working Expenses per cent. of Gross Revenue.	Dividends paid on Ordinary Stocks *
	£	£	Per cent.	Per cent.
1854	20,204,784	1,629,977	49·84	2 $\frac{7}{8}$
1855	20,743,184	1,688,395	48·27	3
1856	21,087,688	1,751,702	46·15	3 $\frac{3}{8}$
1857	22,055,246	1,883,737	44·50	4 $\frac{1}{4}$
1858	22,462,695	1,796,618	45·14	3 $\frac{7}{8}$
1859	22,884,235	1,968,000	43·15	4 $\frac{1}{8}$
1860	23,174,847	2,027,486	43·06	4 $\frac{7}{8}$
1861	23,804,498	2,056,486	44·52	4 $\frac{5}{8}$
1862	26,294,500	2,096,518	44·55	4 $\frac{1}{4}$
1863	31,106,980	2,577,824	45·90	4 $\frac{3}{4}$
1864	31,816,082	3,154,595	46·10	5 $\frac{7}{8}$
1865	37,114,210	3,452,736	46·20	6 $\frac{1}{8}$
1866	38,532,135	3,766,106	47·75	5 $\frac{7}{8}$
1867	39,550,365	3,852,183	48·24	5 $\frac{1}{2}$
1868	40,187,686	3,878,392	47·58	5 $\frac{1}{4}$
1869	40,683,385	4,159,629	45·12	6 $\frac{5}{8}$
1870	41,759,969	4,595,264	44·49	7 $\frac{7}{8}$
1871	43,730,330	5,030,045	44·68	9 $\frac{1}{8}$
1872	45,501,238	5,431,154	48·34	9
1873	47,163,908	6,036,129	51·96	9 $\frac{1}{4}$
1874	50,278,640	6,280,551	54·46	8 $\frac{1}{4}$
1875	52,407,209	6,602,590	54·34	8 $\frac{1}{2}$
1876	54,287,629	6,482,098	54·73	7 $\frac{3}{8}$
1877	55,431,760	6,353,817	54·29	6 $\frac{7}{8}$
1878	56,230,524	6,019,559	52·08	6 $\frac{1}{2}$
1879	56,736,262	5,570,413	50·59	5 $\frac{7}{8}$
1880	57,026,895	6,434,722	48·97	8 $\frac{1}{4}$
1881	57,346,849	6,483,121	49·88	8
1882	57,822,434	6,729,306	50·51	8 $\frac{1}{8}$

* Up to the year 1869, separate dividends at varying rates were paid to the Shareholders of the York, Newcastle and Berwick, York and North Midland, Leeds Northern, Newcastle and Carlisle, and Stockton and Darlington Railway Companies, but in order to make this appendix uniform throughout, the amounts paid in dividends on the ordinary stock of the respective Companies have been added together and applied to the total ordinary capital, thus arriving at an average dividend comparable with those shown subsequent to 1869. In 1870 the stocks were consolidated.

APPENDIX D.—*continued.*

Year.	Capital Expenditure at 31st December.	Gross Revenue.	Working Expenses per cent. of Gross Revenue.	Dividends paid on Ordinary Stocks
	£	£	Per cent.	Per cent.
1883	58,413,798	6,852,013	51·36	8 $\frac{1}{4}$
1884	59,015,485	6,436,758	53·35	6 $\frac{7}{8}$
1885	59,625,486	6,131,051	53·77	6
1886	60,061 253	5,894,792	53·71	5 $\frac{3}{8}$
1887	60,463 600	6,056,016	53·54	5 $\frac{5}{8}$
1888	60,697,806	6,316,526	53·19	6 $\frac{1}{4}$
1889	61,298,165	6,837,870	52·98	7 $\frac{1}{4}$
1890	62 034 019	7,280,951	55·64	7 $\frac{1}{4}$
1891	62,828,784	7,182,463	57·08	6 $\frac{1}{2}$
1892	63,546,759	6,672,415	59·27	4 $\frac{7}{8}$
1893	66,454 726	7,183,463	57·23	5 $\frac{7}{8}$
1894	67,264,819	7,438,323	57·55	5 $\frac{7}{8}$
1895	67,887,797	7,315,599	57·7	5 $\frac{5}{8}$
1896	68,407,796	7,738,128	57·15	6 $\frac{3}{8}$
1897	68,988,495	8,021,917	58·38	6 $\frac{3}{8}$
1898	70,189,778	8,361 444	59·29	6 $\frac{1}{2}$
1899	71,115,421	8,798,702	60·59	6 $\frac{5}{8}$
1900	72,809,837	9,214 017	62·73	6 $\frac{3}{8}$
1901	73,991,803	9,112,179	65·01	5 $\frac{1}{4}$
1902	75,084,876	9,219,512	64·56	5 $\frac{3}{8}$
1903	76,407,545	9,313,063	63·73	5 $\frac{1}{2}$
1904	77,938,017	9,308,630	63·83	5 $\frac{3}{8}$
1905	79,025,115	9,407,931	63·15	5 $\frac{1}{2}$
1906	79,918,260	9,978,062	62·66	6 $\frac{1}{8}$
1907	80,903,631	10,591,335	62·82	6 $\frac{1}{4}$
1908	81,755,227	10,151,421	66·01	5 $\frac{1}{4}$
1909	82,434,166	10,237,558	63·25	6
1910	82,994,546	10,472,058	63·76	6
1911	83,470,815	10,755,276	63·27	6 $\frac{1}{4}$
1912	84,160,972	10,762,983	64·00	6
1913*	84,862,828	12,050,000	63·33	7

* Owing to the change in the form of accounts brought about by the Railway Companies' (Accounts and Returns) Act, 1911, it has been found necessary, for the purposes of comparison, to adjust the figures for this year under the heads of Gross Revenue and Working Expenses.

APPENDIX E.

RAILWAY AND DOCK COMPANIES MERGED IN THE NORTH-EASTERN RAILWAY COMPANY.

(1) RAILWAY COMPANIES.

Name of Company.	Period of Independent Existence.	By what Company Absorbed.
Bedale and Leyburn	1853-1859	North Eastern
Bishop Auckland and Weardale ..	1837-1847	Wear Valley
Blaydon, Gateshead and Hebburn ...	1834-1839 ¹	Newcastle and Carlisle
Blyth and Tyne	1852-1874	North Eastern
Brandling Junction	1836-1845	Newcastle and Darlington Junction
Cawood, Wistow and Selby Light ...	1896-1900	North Eastern
Clarence	1828-1853 ²	West Hartlepool Harbour and Railway
Cleveland	1858-1865	North Eastern
Darlington and Barnard Castle ...	1854-1858	Stockton and Darlington.
Dearness Valley	1855-1857	North Eastern.
Durham Junction	1834-1844	Newcastle and Darlington Junction.
Durham and Sunderland	1834-1846	York and Newcastle
East and West Yorkshire Junction ...	1846-1852	York and North Midland
Eden Valley	1858-1862	Stockton and Darlington
Frosterley and Stanhope	1861-1862	Do.
Great North of England	1836-1850 ³	Newcastle and Darlington Junction
Great North of England, Clarence and Hartlepool Junction	1837- ⁴	—
Hartlepool Dock and Railway ...	1832-1857	North Eastern
Hexham and Allendale... ..	1865-1876	Do.
Hull and Holderness	1853-1862	Do.
Hull and Hornsea	1862-1866	Do.
Hull and Selby	1836-1872 ⁵	Do.
Hylton, Southwick and Monkwearmouth	1871-1883	Do.
Leeds, Castleford and Pontefract Junction	1873-1876	Do.
Leeds and Selby	1830-1844	York and North Midland
Leeds and Thirsk	1845-1849	(Name changed to) Leeds Northern
Leeds Northern	1849-1854	North Eastern
Malton and Driffield Junction ...	1846-1854	Do.

¹ 1839 is date of last official meeting of Company.

For particulars of purchase see p. 268.

² Date of Amalgamation Act, 1852.³ Date of Amalgamation Act, 1846.⁴ Leased in perpetuity to N.E.R.⁵ Date of Amalgamation Act, 1846.

(1) RAILWAY COMPANIES—*continued.*

Name of Company.	Period of Independent Existence.	By what Company Absorbed.
Merrybent and Darlington	1866-1878 ⁶	—
Middlesbrough and Guisbrough ...	1852-1858	Stockton and Darlington
Middlesbrough and Redcar	1845-1858	Do.
Newcastle and Berwick	1845-1847	York and Newcastle
Newcastle and Carlisle	1829-1862	North Eastern
Newcastle and Darlington Junction ...	1842-1846	(Name changed to) York and Newcastle
Newcastle and North Shields	1836-1845	Newcastle and Berwick
North Yorkshire and Cleveland ...	1854-1858	North Eastern
Pontop and South Shields	1842-1846	Newcastle and Darlington Junction
Scarborough, Bridlington and West Riding Junction	1885-1914	North Eastern
Scarborough and Whitby	1871-1898	Do.
Scotswood, Newburn and Wylam ...	1871-1883	Do.
South Durham and Lancashire Union	1857-1862	Stockton and Darlington
Stanhope and Tyne	1834-1841 ⁷	—
Stockton and Darlington	1821-1863	North Eastern
Stockton and Hartlepool	1839-1853 ⁸	West Hartlepool Harbour and Railway
Tees Valley	1865-1882	North Eastern
Wear Valley	1845-1858	Stockton and Darlington
Wear Valley Extension	1892-1893	North Eastern
West Durham	1839-1870	Do.
West Hartlepool Harbour and Railway	1852-1865	Do.
Whitby and Pickering	1833-1845	York and North Midland
Whitby, Redcar and Middlesbrough Union	1866-1889	North Eastern
York and Newcastle	1846-1847	(Name changed to) York, Newcastle and Berwick (see p. 483)
York, Newcastle and Berwick	1847-1854	(Name changed to) North Eastern
York and North Midland	1836-1854	North Eastern

(2) DOCK COMPANIES.

Hartlepool Dock and Railway	1832-1857	North Eastern
Hartlepool West Harbour and Dock	1844-1853 ⁹	(Name changed to) West Hartlepool Harbour and Railway.
Hull Dock	1774-1893	North Eastern
Wearmouth Dock	1834-1846	York and Newcastle

⁶ Company wound up, 1878. Property acquired by N.E.R., 1890. Purchase confirmed by Act, 1900.

⁷ Company wound up, 1841. Property transferred to Pontop and South Shields Company, 1842.

⁸ Date of Amalgamation Act, 1842.

⁹ Date of Amalgamation Act, 1852.

APPENDIX F.

NORTH EASTERN RAILWAY.

Year.	AVERAGE TRAIN LOAD.			Total Freight.	AVERAGE RECEIPTS PER TRAIN MILE.		
	Passenger.	Goods.	Mineral.		Coaching.	Goods.	Mineral.
	Passengers.	Tons.	Tons.	Tons.	d.	d.	d.
1900	* 62·40	44·18	92·49	66·60	45·96	75·20	91·57
1901		45·46	107·56	74·59	46·93	78·45	96·46
1902		58·01	110·10	81·40	47·17	88·18	104·44
1903	The passenger train loads were not regularly taken out until the year 1910.	66·18	125·32	92·39	48·08	98·11	120·17
1904		73·41	133·48	100·22	47·29	108·11	127·91
1905		78·75	138·98	106·73	45·62	115·70	133·49
1906		79·93	143·95	109·92	45·76	116·19	136·42
1907		83·12	150·45	114·70	45·68	116·83	143·39
1908		80·34	158·53	115·66	45·12	113·66	154·01
1909		84·15	169·19	122·89	44·62	121·51	160·86
1910		70·03	87·30	175·74	45·38	125·54	166·05
1911	71·37	89·84	177·31	127·79	46·57	127·97	170·66
1912	72·68	94·24	182·85	131·09	49·22	132·91	173·60

* Estimated train loads.

N.B.—The mileage of Mineral trains includes the mileage of empty returning trains as well as of full trains. Excluding the mileage of the empty trains the average train load would be about double the figures given above.

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